UNESCO CHAIR/UNITWIN NETWORK PROGRESS REPORT FORM

Title of the Chair/Network:	UNITWIN-UNESCO/KU/ICL Landslide and Water-related Disaster Risk Management for Society and the Environment Cooperation Programme
Host Institution:	The Disaster Prevention Research Institute, Kyoto University and the International Consortium on Landslides
Date of establishment of Chair/Network: *(mm, yyyy)*	UNITWIN-UNESCO/KU/ICL Landslide Risk Mitigation for Society and the Environment Cooperation Programme established in March 2003 and revised to the current title in November 2010
Period of activity under report: *(mm, yyyy - mm, yyyy)*	1 November 2016 to 31 October 2018
Report established by: *(name, position)*	Kaoru Takara (Professor) and Ryosuke Uzuoka （Professor） of the Disaster Prevention Research Institute, Kyoto University Kyoji Sassa, Secretary General of the International Consortium on Landslides

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1. Executive Summary:

Major outcomes, results and impact of the Chair, including on national policies, in relation to its objectives as stated in Article 2 of the Chair Agreement (between the Institution and UNESCO)
(Not exceeding 300 words)

1. ***Landslide****s-Journal of International Consortium on Landslides,* 17 issues (4,450 pages) Vol.13 (No. 6), Vol.14 (No.1, 2, 3, 4, 5, and 6), Vol. 15 (No.1, 2, 3, 4, 5, 6, 7, 8, 9, 10) were published under the cooperation of this network and ICL supporting organizations. The impact of this journal is evaluated from the Journal Impact Factor (3.811) released by Thomson Reuters in 2017 and journal CiteScore (4.03) by Elsevier in 2017. No.1 rank for 36 journals in the field of Engineering, Geological of the Impact Factors, and No.1 for 175 journals in the field of Geotechnical Engineering and Engineering Geology of the CiteScore.

2. Organization of the Forth World Landslide Forum (WLF4) from 29 May to 2 June 2017 in Ljubljana, Slovenia. 588 persons from 52 countries and 7 United Nations and International Organizations. The 2017 Ljubljana Declaration on Landslide Risk Reduction-Contributing to the Sendai Framework for Disaster Risk Reduction was adopted. It declared the organization of the Fifth World Landslide Forum in Kyoto, Japan in 2020 and the concept of the establishment of

"Kyoto 2020 Commitment for Global Promotion of Understanding and Reducing Landslide Disaster Risk (KC2020) as a further and wider development of ISDR-ICL Sendai Partnerships 2015-2025. Five volumes of full color books were published containing papers presented in WLF4. In order to widen the ICL networks for the promotion of the planned KC2020, ICL decided to create a new ICL membership category (20 % membership fee) "ICL Associates" in 2017 and started it from April 2018. 15 organizations from 9 countries has registered as of 29 September 2018

3. ISDR-ICL Sendai Partnerships 2015-2025

ICL and UNITWIN Network organization proposed the ISDR-ICL Sendai Partnerships 2015-2025 for global promotion of understanding and reducing landslide disaster risk at the Third United Nations World Conference on Disaster Risk Reduction in Sendai, Japan in March 2015. It was adopted and signed by 22 global organizations (ICL, UNISDR, UNESCO, FAO, UNU, WMO, UNU, ICSU, WFEO, IUGS, IUGG, IRDR, Governments of Japan, Italy and Croatia, Vietnam, Indonesia, Slovenia, EuroGeoSurveys and others) in 2015 and also in 2017.

Two volumes of Landslide Dynamics: the ISDR-ICL Landslide Interactive Teaching Tools were published in 2018. Supplementary materials such as PPT tools for lessons and PDF tools for references were also published in the digital forms together with these two books.

4. Book publication for understanding and reducing landslide disaster risk assessment by this UNITWIN Network. The following seven full color books were published for research presentation and also capacity development.

1) Volume 1 : ISDR-ICL Sendai Partnerships 2015-2025 (Kyoji Sassa, Matjaž Mikoš, Yueping Yin, eds.) of « Advancing Culture of Living with Landslides » (2017). Springer, 586p.The book is an open access book as well as a full color printed book (586 pages). This book includes activity reports of IPL projects and WCoEs and ICL networks in 2014-2017. Everybody can download the whole book free of charge from the link below.

https://link.springer.com/book/10.1007%2F978-3-319-59469-9

The number of downloading of this book is 222,332 as of 30 August 2018 from its publication in May 2017. The book is beneficial for many of landslide related orgnaizations and individuals from the workd

2) Volume 2 : Advances in Landslide Science (Matjaz Mikos, Binod Tiwari, Yueping Yin, Kyoji Sassa, eds.) of « Advancing Culture of Living with Landslides ». (2017). Springer, 1197p.

3) Volume 3 : Advances in Landslide Technology (Matjaž Mikoš, Željko Arbanas, Yueping Yin, Kyoji Sassa, eds.) of « Advancing Culture of Living with Landslides ». (2017). Springer, 621p.

4) Volume 4: Diversity of Landslide Forms (Matjaž Mikoš, Nicola Casagli, Yueping Yin, Kyoji Sassa, eds.) of « Advancing Culture of Living with Landslides ». (2017). Springer, 707p.

5) Volume 5 : Landslides in Different Environments (Matjaž Mikoš, Vít Vilímek, Yueping Yin, Kyoji Sassa, eds.) of « Advancing Culture of Living with Landslides ». (2017). Springer, 557p.

6) Landslide Dynamics: ISDR-ICL Landslide interactive Teaching Tools. Volume 1. Fundamental, Mapping and Monitoring (Kyoji Sassa, Fausto Guzzetti, Hiromitsu Yamagishi, Zeljko Arbanas, Nicola Casagli, Mauri McSaveney, Khang Dang, eds) (2018). Springer, 604p.

7) Landslide Dynamics: ISDR-ICL Landslide interactive Teaching Tools. Volume 2: Testing, Risk Management and Country Practices (Kyoji Sassa, Binod Tiwari, Ko-Fei Liu, Mauri McSaveney, Alexander Strom, Hendy Setiawan, eds.) (2018). Springer, 836p.

5. 49 projects of the International Programme on Landslides (IPL): a programme of ICL for landslide disaster risk reduction are implemented by 46 research group in 20 countries within the ICL full member organizations (65 member organizations in 33 countries). 22 projects within ongoing 49 projects are continued before 2016. 16 new projects were proposed and approved in 2016 and 11 new projects have were proposed and approved in 2017.
<http://iplhq.org/category/iplhq/ipl-ongoing-project/>

6. 20 World Centres of Excellence on Landslide Risk Reduction 2017-2020 were identified at the 4th

World Landslide Forum in Ljubljana, Slovenia in May 2017. Those are working for thematic network and regional network of ICL as the core of ICL and the UNITWIN network. <http://iplhq.org/category/iplhq/world-centre-of-excellence-wcoe/>

7. Four new UNESCO Chairs were established in these three years within this UNITWIN Network:
   - Prevention and Mitigation of Geo-hydrological Hazards at University of Florence, Italy in 2016.
   - UNESCO Chair for Water Related Disaster Risk Reduction at University of Ljubljana, Slovenia in 2017.
   - UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development at Kyoto University in 2018.
   - UNESCO Chair on Geoenvironmental Disaster Reduction at Shimane Universty in 2018.

2. Activities:
Overview of activities undertaken by the Chair during the reporting period

UNITIWN network includes Kyoto University, ICL headquarters, and 65 ICL full member organizations from 33 countries and 15 ICL associates from 9 countries.
All members are invited to contribute their activities to the International Journal "Landslides". The journal published 4,450 pages of articles in this reporting period including 6 categories (Review papers, Original papers, Recent Landslides, Technical Notes, IPL/WCoE activities and News/Kyoto Commitment. Articles were contributed from ICL members and non ICL members. The journal is distributed to all ICL members free of charge and donated to ICL supporting members. Non-ICL members can access to the journal from their journal subscribed organizations free of charge or commercially Springer, the publisher.

Activities of this UNITWIN network were published in Journal "Landslides" and five volumes of full color books "Advancing Culture of Living with Landslides" and two volumes of Landslide Dynamics: ISDR-ICL Landslide interactive Teaching Tools.

Other activities taken by the UNITWIN Network are reported.

a) Education/Training/Research
i) Education leading to Certificate

Ninteen (22) Ph.D. were awarded as the UNITWIN education/training/research in the reporting period 2016.11-2018.10.
Fifty three (53) Master's degree were awarded as the as the UNITWIN education/training/research in the reporting period 2016.11-2018.9.

- 9 Ph.D, 15 Master in Geological Sciences and technologies, 16 Master Theses in Civil Engineering and in Environmental Engineering were awarded at UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence. The University of Florence UNESCO Chair opened and new International Academic Master's Degree (totally in English language) on "Geoengineering" focused to train experts on prevention, management and mitigation of geo-hydrological risks. The Master started in the academic year 2017/2018 (https://www.ing-gem.unifi.it)
- 4 Ph.D. and 4 M.Eng. were awarded at UL FGG, Ljubljana, Slovenia
- 3 PhD, 2 Master were awarded at Northeast Forestry University, China
- 2 PhD were awarded at Kyoto University, Japan
- 2 PhD, 1 Master were awarded at Charles University, Prague, Czech Republic
- 1 PhD, 10 Master's degree were awarded at Amrita Vishwa Vidyapeetham, India
- 1 PhD was awarded at Tohoku Gakuin University, Japan

- 3 Master´s degree were awarded at UNAM, Mexico
- 2 Master's degree were awarded at Institute of Rock Structure and Mechanics, Czech Academy of Sciences

ii)Training (short term)

2017, August 5-20. 11th Kokomeren Summer School on Rockslides and Related Phenomena, Kyrgyzstan, Kokomeren River basin. 14 participants from Austria, Germany, Russia, Japan, Poland, Belgium, Kazakhstan, Tajikistan, Kyrgyzstan, Uzbekistan attended field training course. (4 participants from Central Asia were supported by the UNESCO Almaty Cluster office).

2017, Peru – training course for Peruvian experts on landslide field monitoring practices including methodological hand-out.

2018, August 15-30. 12th Kokomeren Summer School on Rockslides and Related Phenomena, Kyrgyzstan, Kokomeren River basin. 23 participants from Kyrgyzstan, Kazakhstan, Uzbekistan, Tajikistan, Argentina, Japan, Belgium, Austria, Germany, Czech Republic (one of them is from Slovakia), Slovenia and Korea attended field training course. (4 participants from Central Asia were supported by the UNESCO Almaty Cluster office).

A 3-Week Doctoral Summer School was organized in Ljubljana in the field of Natural Disasters (May 21 – June 10, 2017).

Technical Conference: "*New technologies for geohazards risk reduction and cultural heritage protection". Seminar: "Surface Processes in Mountain Enviroments*". Held by Dr. Sara Savi Institute of Earth and Environmental Science, Universität Potsdam, Germany. Florence, November 9, 2016.

Technical Seminar: "*Slope Stability Analysis Program – SSAP2010 (4.7.8-2016)*". Held by Prof. Lorenzo Borselli. Professor of Geotechnics and Applied Geology, Instituto de Geologia, Universitad Autonoma de San Luis Potosì, Mexico. Florence (Italy), November 10, 2016.

Technical seminar in the framework of the "*13th Bamiyan Expert Working Group Meeting*", for the Safeguarding of the Cultural Landscape and Archaeological Remains of the Bamiyan Valley. Munich Germany 1-3 December 2016

Seminar: "Subsidence and landslides in Mexico". Held by Prof. Víctor Manuel Hernández Madrigal, Instituto de Investigaciones en Ciencias de la Tierra, Universidad Michoacana de San Nicolás de Hidalgo, Mexico. Florence (Italy), December 15, 2016.

Technical Seminar: "The use of infrared thermography for building safety diagnostics". Istituto Superiore Antincendi (ISA), National Department of Firefighters, Public Rescue and Civil Defense, Rome (Italy), January 24, 2017.

Technical Seminar: "UAV & SAR: Drones in Rescue Operations". Istituto Superiore Antincendi (ISA), National Department of Firefighters, Public Rescue and Civil Defense, Rome (Italy), March 29, 2017.

The 2018 edition of the international school for PhD students and young doctors on "LAndslide Risk Assessment and Mitigation" (LARAM) was held in Italy, at the University of Salerno, from 3 to 14 September.

International Scientific Committee UNESCO/Japanese Funds-in-Trust for Strengthening the Conservation and Management of Lumbini, the birthplace of Lord Buddha. Lumbini, Nepal, 17-19 February 2017.

Seminar: "An Introduction to Climate Change and Downscaling". Held by Dr. Simone Fatichi. Research Associate and Lecturer at the Institute of Environmental Engineering at the ETH Zurich. Firenze (Italy) March 2, 2017.

Seminar: "Evaluation of scouring reliability at bridge pier foundations". Held by prof. A.Melih Yanmaz of the Dept. of Civil Engineering, Middle East Technical University (Turkey). Firenze (Italy), March 7, 2017.

Seminar: "Safety in Geotechnical Fieldwork", held by Prof. Eddie Bromhead, Former Professor of Geotechnical Engineering at Kingston University (UK). Florence (Italy), March 9, 2017.

Conference: "Event and Hydraulic and Geo-Hydrological Hazards scenarios". Held by Prof. Pasquale Versace, director of CAMILab (Laboratory of enviromental Cartography and Geo-Hydrological modelling at the Calabria University), Centre of Competence of the Italian Civil Protection

Department. Florence (Italy), March 30, 2017.

Seminars Cycle: "Climate Change, Water Resources and Hydraulic Risk in Macedonia". Held by prof. Katerina Donevska, Ss Cyril and Methodius University, Skopje (Macedonia). Florence (Italy) 5-6 April 2017.

Conference: "Geomorfosites and Geotourism in Romania". Held by Dr. Mihaela Verga, Department of Geomorphology, Pedology and Geomatics, University of Bucharest. Florence (Italy), May 10, 2017.

Workshop: "Innovative survey and monitoring tools for geological and geotechnical analysis and modelling". Held by Giovanni Barla (Polytechnic University of Turin), Giovanni Gigli (DST-UNIFI), Johann Facciorusso (DICEA). Florence (Italy), June 19, 2017.

Seminar: "The landslide story from Wenchuan earthquake region, China". Held by Xuanmei Fan and Yonghong Luo (State Key Laboratory of Geohazard Prevention and Geoenvironment Protection, Chengdu University of Technology). Florence (Italy), September 26, 2017.

Workshop: "Knowledge sharing and capacity building on Protection of Cultural Heritage from Geo Hazards". Petra College for Tourism and Archaeology, Al Hussein Bin Talal University, Jordan, 17 November 2017.

Seminar: "Fusing complex network analytics with granular micromechanics for early prediction of granular failure from kinematical data". Held by Antoinette Tordesilas (School of Mathematics and Statistics, University of Melbourne). Florence (Italy), December 5, 2017.

Seminar: "The Methodology for the Conservation and Strengthening of the Rock-Cut Churches and the Drainage System for Monastic Complex of Geghard". February, 13–16, 2018 Yerevan (Armenia).

Seminar: "Optical fibers applied for monitoring". Held by Monica Papini and Laura Longoni (Department of Environmental and Civil Engineering, Polytechnic University of Milan). Florence (Italy), May 14, 2018.

Seminar: "Characterization and monitoring of rocky slopes throughout 3D point clouds. Past and present experiences in the application of InSAR for the study of land subsidence due to groundwater withdrawal in Spain. Roberto Tomas Jover - Professor at Departamento de Ingeniería Civil - Escuela Politécnica Superior - Universidad de Alicante. Florence (Italy), July 12 2018.

Seminar: "Similarities and differences between earthquake and rainfall induced landslides". Held by Binod Tiwari Binod - Professor at Civil and Environmental Engineering Department - California State University – Fullerton. Florence (Italy), 03 September 2018.

Summer School in Pavia, Italy (V. Vilímek), June 2018

2018/8/27-9/1 IRDR ICoE-Taipei training course for Landslide Risk Reduction host by IRDR ICoE-Taipei and NCU.

Advanced Institute -Landslide Risk Reduction Training School (AI-LRRTS) -- Landslide hazards: From Site Specific to Regional Assessment" calls for participants from young to mid-career practitioners, researchers and policy makers in Asia and the Pacific region with enhanced understanding, skills and practical knowledge to apply practical approaches in DRR research focusing on landslide analysis, laboratory testing, monitoring, modeling, and landslide hazard evaluation.

iii) Research

Research is the main activities of this UNITWIN Network. By the suggestion by 6 participatns from UNESCO at the ICL doundaiton meeting in January 2002, the International Programme on Landslides (IPL) was established within the frame of he UNESCO Chair/UNITWIN programme at the same time of ICL foundation in 2002. The core of Reseach activities in UNITWIN Programme is IPL projects. Currently 49 IPL projects are conducted in 20 countries. 20 Word Centres of Excellence on Landslide Risk Reduction 2017-2020 are working for landslide disaster risk reduction in 16 countries.

Four new UNESCO Chairs were established in these three years within this UNITWIN Network:
Prevention and Mitigation of Geo-hydrological Hazards at University of Florence, Italy in 2016, UNESCO Chair on Water Related Disaster Risk Reduction at University of Ljubljana, Slovenia in 2016, UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development at Kyoto

University in 2018, and UNESCO Chair on Geoenvironmental Disaster Reduction at Shmane Universty in 2018.

b) Conference/Meetings

The most important conference held in this period is "the Fourth World Landslide Forum, Ljubljana, Slovenia, 29 May – 2 June 2017. 588 participants from 52 countries and 7 United Nations and International organizations. Most members of UNITWIN Network joined this conference.

2017 ICL-IPL Conference held at UNESCO Headquarters, Paris, 29 November to 1 December 2017.
54 leaders of UNTWIN network attended it. Ms Flavia Schlegel, Assistant Director General of UNUESCO for Natural Sciences and Mr. Koji Kitayama, Deputy Parmanent Delegate of Japan addressed opening speech.

Other Conference/Meetings which was organized or presened by UNITWIN Network members are the followings.

- UNISDR Global Platform for Disaster Risk Reduction, Cancún, Mexico, May 22-26, 2017.
- IDRiM2017, 8th Conference of the International Society for Integrated Disaster Risk Management, Reykjavik, Iceland, 23-25 August, 2017.
- Disaster Prevention and Resilient Society, Science and Technology in Society forum, Kyoto, October 1-3rd, 2017.
- 9th International Conference on Geomorphology of the International Association of Geomorphologists (IAG), New Delhi, India, November 6-11, 2017.
- Two local (Czech) conferences dedicated to landslide hazard and risk reduction: along transportation corridors (June 2017), about possible government contribution to the DRR (November 2017, Parliment of the Czech Republic).
- 3rd Regional Symposium on Landslides in the Adriatic-Balkan Region (3rd ReSyLAB), Ljubljana, October 11-13, 2017.
- UNESCO Chair on "Prevention and sustainable management of geo-hydrological hazards" has participated to the World Conference "Mobilizing the UNESCO Chairs in Natural Sciences for political action towards the 2030 Agenda", held in Geneva from July 5th-7th 2017, where the "Geneva Milestone" was signed. In this document is described how the UNESCO Chairs can contribute to the achievement of the 2030 Agenda for a Sustainable Development, by means of the Sustainable Development Goals (SDGs).
- ERT training (28-10-2017 to 15-11-2017): Amrita University has collaborated with British Geological Survey for installation and application of time-lapse electrical resistivity tomography (ERT).
- Italy's landslide early warning system: (13-July-2018): Amrita faculties attended this webinar by CNR Italy about the Italian Early Warning System in operation.
- An introduction to objectively derived weather patterns for India and their forecasting applications (5-September-2018): Met office, UK gave a webinar on the above topic.
- Numerical Simulation of Propagating Landslides (March-8-2017): Prof. Massimiliano Cremonesi from Politecnico di Milano gave a 3 hour guest lecture on numerical simulation and modelling of landslides.
- Engineering Geology Conference between China, Hong Kong and Taiwan, 2017/5/12-14.
- AOGS, Singapore, 2017/8/6-11.
- The 4th Slope Tectonics Conference in Kyoto, Japan, 2017/10/14-18.
- The 11th Asian Regional Conference of IAEG in Nepal, 2017/11/28-30
- The 5th International Symposium on Mega Earthquake Induced Geo-disasters and Long Term Effects, Chengdu, China, 2018/5.
- AOGS, Honolulu, Hawaii, 2018/6/3-8.
- Cross-Straits Symposium on Engineering Geology, 2018/8/20-24
- IRDR ICoE-Taipei training course for Landslide Risk Reduction, 2018/8/27-9/1
- XIII IAEG Congress - San Francisco 2018, 2018/9/17-21

c) Interuniversity Exchange.

Within 65 ICL full member organizations and 15 associate members, 43 members are from universities. ICL organized the annual meeting and symposium once or twice in 2016, 2017 and 2018. ICL will organize the annual meeting at the National Kyoto Internatioanl Conference Center (KICC) and the Disaster Prevention Research Instituute of Kyoto University, in Kyoto, Japan on 1-4 December 2018. 89 persons will attend the meeting. 16 new IPL project proposals have been submitted and the currently those evaluation of application are ongoing. Those new project proposal will be orally presented and discussed and examined at the meeting. Ths annual meeting is the place for the annual interuniversity exchage.

✓ 5 visiting students at UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence

- Carla Gisela Tranquilino Espinoza (Universidad Nacional Autonoma de Mexico) (Ms candidate). Theisis title: “Dinamica de flujos de escombros cohesivas a travès de simulaciones numericas”. Tutor: Dr. Lizeth Caballero Garcia.
- Cecilia Irene Villaseñor Reyes (3rd year PhD candidate). Thesis title: “InSAR application for the study and detection of deep seated gravitational slope deformations in eastern Michoacan, Mexico”Instituto Potosino de Investigación Científica y Tecnológica A.C (IPYCIT). Tutor: Prof. Víctor Manuel Hernandez Madrigal
- Chao Zhou (3rd year PhD candidate). Thesis title: “Landslide mapping and deformation analysis with the application of PSInSAR in The Three Gorges Reservoir Area, China”, University of Florence and China University of Geosciences. Tutors: Prof. Filippo Catani and Prof. Kunlong Yin.
- Miguel Angel Rincones Salinas (3rd year PhD candidate). Universidad Politécnica de Madrid. Thesis title: "Integration of statistical and remote sensing techniques to identify CO2 emissions in geologic storage site by the study of natural analogues". Tutors: Prof. Nicola Casagli and Prof. Grazia Tucci.
- Pablo Ezquerro (Universidad Politécnica de Madrid) (3rd year PhD candidate). Thesis title: "Aplicación de técnicas espaciales y terrestres a la monitorización y modelización de deformaciones en la Península Ibérica". Tutors: Prof. Gerardo Herrera and José Antonio Fernández Merodo.

✓ 5 Visiting Professors and Researchers at UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence:

- Víctor Manuel Hernández Madrigal (Researcher at the Instituto de Investigaciones en Ciencias de la Tierra, Universidad Michoacana de San Nicolás de Hidalgo, Morelia, Mexico);
- Sara Savi (Post-Doc Researcher at the Institute of Earth and Enviromental Sciences, University of Potsdam, Germany);
- Lorenzo Borselli (Professor at Universidad Autonoma de San Luis Potosi, Zona Universitaria, Ciudad Valles, Mexico)
- Vanessa Canavesi (Researcher at CEMADEN - Centro Nacional de Monitoramento e Alertas de Desastres Naturais, São José dos Campos, Brasil)
- Roberto Tomas Jover - Professor at Departamento de Ingeniería Civil - Escuela Politécnica Superior - Universidad de Alicante.

✓ 3 university students did their practices at Institute of Rock Structure and Mechanics, Czech Academy of Sciences.

✓ Charles University has Interuniversity Exchange with Florence University (1 PhD)

✓ International Joint Project: LANDSLIP
Overall aim of LANDSLIP project is to contribute to better landslide multi-hazard risk assessment, early landslide warning and working with communities for better preparedness, for hydrologically controlled landslides and related hazards, on a regional to catchment spatial scale and a seasonal to daily temporal scale in India. Landslip consortium consists of 8 international: three in India, one in Italy and five in the UK. The partner’s expertise are in social sciences, social practitioners, disaster risk reduction, meteorology, landslides and multi-hazards.

✓ Amrita & Politecnico di Milano : Joint center

AMRITA and POLIMI, agree to cooperate in joint scientific investigations in the field "Numerical Simulation of Landslides and Real-time monitoring of Natural Disasters".
The scientific investigations from the side of AMRITA shall be carried out in the Department of Wireless Networking and Applications, those from the side of POLIMI – in the Department of Civil and Environmental Engineering.

✓ Amrita & CNR,Italy: Joint center

CNR is a research institute of the Italian National Research Council. This joint center is to promote international academic and research co-operation in the following areas:

(a) Institutional exchanges between faculty and researchers from each partner institution;

(b) Organization of training programmes, symposia, conferences, short courses and meetings on research issues in hydrological problems of mutual interest;

(c) Exchange of information, resources and expertise pertaining to developments in hydrometeorological monitoring (ground and satellite observations), flash floods, floods and droughts, groundwater, climate change and natural hazards (floods, landslides, melting glaciers, earthquakes) studies, methodologies, research and innovation;

(d) Acceptance of Amrita graduate students for collaborative research between the Parties for periods of study and/or research; and

(e) Co-operation in any other areas of interest of the Parties, as agreed to by the Parties.

✓ Landslide group in National Central University, Chinese Taipei :

2016.11 Sate Key Laboratory of Geohazard Prevention and Geoenvironment Protection, ChengDu University of Technology, China

2017.12 Sate Key Laboratory of Geohazard Prevention and Geoenvironment Protection, ChengDu University of Technology, China

d) Publications/Multimedia Materials

Refer to the attached list.

e) Cooperation with UNESCO Headquarters, Field Offices

ICL was founded by UNESCO-Kyoto University Joint symposium (IGCP-425 Lanslide Hazard Assessment and Cultural Heritage) in 2002. IPL (International Programme on Landslides) was founded as a landslidle version of IGCP. The Chair of the IPL Global Promotion Committee which manges all of IPL matters, is Qunli Han (the fomer Director of the Ecological Sciences and Earth Sciences of UNESCO, the current Executive Director of the Integrated Research on Disaster Risk (IRDR). The deputy chair is Giuseppe Arduino (Chief Ecohydrology, Water Quality and Water Education Section Division of Water Sciences, of UNESCO). Soichiro Yasukawa Programme Specialist, Coordinator for Disaster Risk Reduction and Resilience, Section on Earth Sciences and Geo-hazards Risk Reduction, Natural Sciences Sector of UNESCO is a focal point of ICL and attended most of ICL meetings and also attend ICL-IPL meeting in Kyoto in 2018. Two sessions for the Fifth World Landslidle Forum held in Kyoto, 2020 have been proposed by UNESCO headquarters and also its Kazakhsan office; 1) Landslides and hazard assessment at UNESCO designated sites, 2) Landslides in Central Asia.

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence:

- Participation to the National Meeting of the Italian UNESCO Chairs, Rome (Italy), April 26, 2017.

- Participation to the World Conference "Mobilizing the UNESCO Chairs in Natural Sciences for political action towards the 2030 Agenda", held in Geneva from July 5-7th 2017, where the "Geneva Milestone" was signed. In the guidelines of this document is described how the UNESCO Chairs can contribute to the achievement of the 2030 Agenda for a Sustainable Development, by means of the Sustainable Development Goals (SDGs).
- The Chair, as a member of ICL, is contributing to draft the Kyoto 2020 Committment. This committment wants to promote global landslide disaster risk reduction and it will be signed by all parties who will attend the 5th World Landslide Forum, to be held in Kyoto (Japan), November 2-6, 2020) and who will be ready to voluntarily commit to this initiative as a contribution to the International Strategy for Disaster Reduction and to the Sendai Framework for Disaster Risk Reduction.
- The Chair participated to the "Workshop on water and environmental global challenges: International water infrastructures and security" (co-organized with UNESCO-WWAP and UNESCO chair on water resources management and culture), held in Miami (USA), May 25, 2017.
- The Chair partecipates to several national and international missions, in collaboration with UNESCO and official partners, to promote the protection of the World's cultural heritage threatened by geo-hydrological hazards, some of which part of the UNESCO World Heritage list, especially in developing countries: Afghanistan (Bamyan, Herat, Shar-E-Zohak), Kyrgyzstan, Mongolia, Georgia (Vardzia and Katskhi), Giordania (Petra), Egypt, Ethiopia (Lalibela), Madagascar (Antananarivo), North Korea (Kogurio), Myanmar (Kyaiktiyo Pagoda), Nepal (Lumbini), Bolivia (Tiwanaku), Chile (Rapa Nui, Easter Island).

AMRITA University:

- Participated in the ICL-IPL UNESCO Conference held in Paris on 15-18, November-2016
- Tech4Dev 2018: Voices of the Global South | 27-29 June 2018, Lausanne, Switzerland - The UNESCO Chair in Technologies for Development's 5th International Conference, Tech4Dev 2018: Voices of the Global South, hosted by the Cooperation and Development Center-CODEV at the Swiss Federal Institute of Technology in Lausanne-EPFL, 27-29 of June 2018, Lausanne, Switzerland.

f) Other

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence:

- The Department of Earth Sciences of the University of Firenze since 2008 is recognized as World Centre of Excellence (WCoE) on landslide risk reduction by the Global Promotion Committee of the International Programme on Landslides (IPL/GPC); this triennial achievement was confirmed in 2011, 2014 and 2017.
- The Earth Sciences Department of the University of Firenze (UNIFI) is the official Centre of Competence of the Italian Civil Protection for Remote Sensing and Geohazards (Directive of the Italian Prime Minister of 27 February 2004; Decree of the Head of the Italian National Civil Protection Department no. 252 of 25 January 2005); this achievement was confirmed four consecuive times: in 2006, 2007, 2011 and 2013 respectively.
- The Chair has contributed to the "Science for Disaster Risk Management 2017", by the Disaster Risk Management Knowledge Center of the Joint Research Center, a leading scientific report representing a contribution to the Science and Technology Roadmap in the context of the Sendai Partnership 2015-2025.

AMRITA University:

- Participated in the WLF-4, held in Slovenia from may-29 to June-3 2017

a) Education/Training/Research *(key education programmes and training delivered and research undertaken by the Chair during the reporting period, target group and geographical coverage)*	
i) Education (leading to certificate)	ICL conducted Japan-Vietnam SATREPS (Science and Technology Research Partnerships for Sustainable Development) project "Development of landslide risk assessment technology along transport arteries in Vietnam" May 2011-March 2016 and the followup education has continued until March 2018. The following three persons from Vietnam obtained Ph.D as a part of this project in the Disaster Prevention Research Institute, Kyoto University and in the Tohoku Gakin university from November 2016 to March 2018. Capacity development leading to Ph.D in ICL headquarters. PHAM Van Tien Date obtained PhD: March 26, 2018 Field: Civil Engineering Institution: Graduate School of Engineering, Kyoto University Thesis title: Mechanisms and Hazard Assessment of Landslide-Induced Dams LAM Huu Quang Date obtained PhD: March 26, 2018 Field: Civil Engineering Institution: Graduate School of Engineering, Kyoto University Thesis title: Development of Hazard Assessment Technology of The Precursor Stage of Landslides Eva Mia Siska Date obtained PhD: March 26, 2018 Field: Civil Engineering Institution: Graduate School of Engineering, Kyoto University Thesis title: IMPACT OF RAPID DEVELOPMENT GROWTH ON WATER RESOURCES SITUATION IN TOURISM DEPENDENT ECONOMY: A CASE STUDY OF BALI, INDONESIA Karlina Date obtained PhD: March 26, 2018 Field: Civil Engineering Institution: Graduate School of Engineering, Kyoto University Thesis title: ASSESSMENT OF HYDRO-METEOROLOGICAL DROUGHTS RELATED TO ENSO IN LOMBOK AND SUMATRA ISLANDS, INDONESIA NGO Doan Dung Date obtained PhD: March 26, 2018 Field: Human informatics Institution: Graduate School of the Tohoku Gakuin University Thesis title: Total Management of Landslide Disaster along Main Roads in Tropical Mountain Ranges **<u>Education leading to Ph.D</u>** **University of Florence, Italy (9 PhD):** Tommaso Carlà — Doctor of Philosophy (PhD.)

	School: Regional School of Earth Science (XXX Cycle), Department of Earth Sciences, University of Florence, Title of Doctor Dissertation: Time series analysis of monitoring data for early warning purposes. Tutor: Prof. Nicola Casagli Date of certification: April 2018 Lorenzo Solari — Doctor of Philosophy (PhD.) School: Department of Earth Sciences, University of Florence, Regional School of Earth Science (XXX Cycle), Title of Doctor Dissertation: Spaceborne radar remote sensing: hydrogeological events monitoring and future developments Tutors: Prof. Sandro Moretti; Andrea Ciampalini Date of certification: April 2018 Michele D'Ambrosio — Doctor of Philosophy (PhD.) School: Regional School of Earth Science (XXX Cycle), Department of Earth Sciences, University of Florence, Title of Doctor Dissertation: Analysis of slope deposits in Tuscany for applications in the modeling of surface processes and landscape evolution Tutor: Prof. Filippo Catani Date of certification: April 2018 Matteo Del Soldato — Doctor of Philosophy (PhD.) School: Department of Earth Sciences, Environment and Resources, Federico II University of Napoli; Department of Earth Sciences, University of Florence; Departamento de Ingeniería Civil, Universidad de Alicante Title of Doctor Dissertation: Integration of field investigations and remote sensing techniques for the assessment of landslide activity and damage Tutors: Prof. Domenico Calcaterra; Prof. Nicola Casagli; Prof. Roberto Tomas Date of certification: May 2017 Giulia Dotta — Doctor of Philosophy (PhD.) School: Department of Earth Sciences, University of Florence Title of Doctor Dissertation: Semi-automatic analysis of landslide spatio-temporal evolution Tutor: Prof. Giovanni Gigli Date of certification: April 2017 Teresa Salvatici — Doctor of Philosophy (PhD.) School: Department of Earth Sciences, University of Florence Title of Doctor Dissertation: Combining remote sensing techniques with numerical modeling for the runout analysis of shallow rapid landslide Tutor: Prof. Nicola Casagli Date of certification: April 2017 Tommaso Pacetti — Doctor of Philosophy (PhD.) School: International Doctorate in Civil and Environmental Engineering (XXX Cycle), University of Florence: Department of Civil and Enviromental Engineering. Title of Doctor Dissertation: Investigating water energy land ecosystem nexus for integrated water resources management Tutor: Prof. Enrica Caporali Date of certification: May 2018 Valentina Chiarello — Doctor of Philosophy (PhD.) School: International Doctorate in Civil and Environmental Engineering (XXVIII Cycle),

	University of Florence: Department of Civil and Enviromental Engineering. Title of Doctor Dissertation: Analysis with uncertainty of hydrological extreme events Tutor: Prof. Enrica Caporali Date of certification: November 2016 Pina de Cicco — Doctor of Philosophy (PhD.) School: International Doctorate in Civil and Environmental Engineering (XXVIII Cycle), University of Florence: Department of Civil and Enviromental Engineering. Title of Doctor Dissertation: Experimental and numerical investigations on wood accumulation at bridge piers with different shapes Tutors: Prof. Luca Solari, Prof. Enio Paris. Date of certification: May 2017 **Charles University, Prague, Czech Republic (2 PhD):** Adam Emmer - PhD School: Charles University, Prague, Czech Republic Title: Dynamic of evolution and hazardousness of lakes within the Cordillera Blanca, Peru Date of certification: 19.9.2017 Michal Kusák - PhD School: Charles University, Prague, Czech Republic Title: Morphostructural analysis of the Ethiopian Highland using RS data Date of certification: 19.9.2017 **Northeast Forestry University, China (3 PhD):** Zhaoguang Hu — Doctor of Engineering (PhD.) School: College of Engineering and Technology, Northeast Forestry University, China. Title of Doctor Dissertation: The Characteristics of permafrost degradation in Lesser Khingan Mountains of China and its effect on Road subgrade stability. Date of certification: 16 September 2017 Yuzhuo Wang — Doctor of Engineering (PhD.) School: College of Engineering and Technology, Northeast Forestry University, China. Title of Doctor Dissertation: Research on water seepage-drainage geogrid reinforcement mechanism of roadbed under the action of freezing and thawing Date of certification: 16 September 2017 Kun zhang — Doctor of Engineering (PhD.) School: College of Engineering and Technology, Northeast Forestry University, China. Title of Doctor Dissertation: Erosion and destruction mechanism and electrochemical control of chloride salt (deicing salt) on concrete structures Date of certification: 16 September 2017 **Amrita Vishwa Vidyapeetham, India (1 PhD):** Rekha P — Doctor of Philosophy (PhD.) School: Amrita Vishwa Vidyapeetham Title of Doctor Dissertation: Context Aware Techniques for Energy Efficient Data Acquisition in Wireless Iot for Disaster Monitoring Date of certification: 31-08-2018 **University of Ljubljana, Ljubljana, Slovenia (4 PhD):**

Sodnik Jošt – PhD
School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia
Title: Debris flow hazard assessment on torrential fans.
Date of Certification: 11 December 2017

Peternel Tina – PhD
School: Faculty of Natural Sciences and Engineering, University of Ljubljana, Ljubljana, Slovenia
Title: Dynamics of the slope mass movements in the Potoška planina with analyses of results of remote sensing and terrestric surveys techniques and in-situ measurements
Date of Certification: December 2017

Rak Gašper – PhD
School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia
Title: Water surface topology of supercritical confluence flow
Date of Certification: 4 September 2017

Zabret Katarina – PhD
School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia
Title: Influence of meteorological and vegetation parameters on rainfall interception
Date of Certification: 20 June 2018

Education leading to Mater's Degree

Charles University, Czech Republic (2 Master):

Racek O. - Master's Degree (2018) Landslide susceptibility analysis of Czechia. MSc Thesis, Faculty of Physical Geography and Geoecology, Charles University, Czech Republic.

Olejár F. - Master's Degree (2018) Stability of volcanic islands in relation to giant landslides on the example of El Hierro Island, Canary Islands. MSc Thesis, Institute of Hydrogeology, Engineering Geology and Applied Geophysics, Charles University, Czech Republic

University of Florence, Italy (31 Master):

Roberto Montalti, "Quantitative evaluation of conformance to design geometry of open pit excavation works, using high-resolution Lidar data". Department of Earth Sciences, University of Florence, Tutor: Prof. Filippo Catani

Agnese Turchi, "Hydrogeological instability in the basin of the Misa river: which solutions are possible for a more sustainable land management?" Department of Earth Sciences, University of Florence. Tutor: Prof. Riccardo Fanti

Miriana Petrolo, "Assessment of a phisically-based model for shallow landslide forecasting in Valle d'Aosta region". Department of Earth Sciences, University of Florence, Tutor: Prof. Filippo Catani, Veronica Tofani

Damiano Steri, "Application of numerical models for the stability analysis and landslide propagation mechanisms in Sciara del Fuoco (Stromboli, Italy)". Department of Earth Sciences, University of Florence. Tutor : Prof. Nicola Casagli

	Simone Giachi, "Terrestrial laser scanning and aerial photogrammetric data comparison for the quantitative characterization of rock masses". Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli Daniele de Lisa, “Analysis of stress and deformation state related to landslide triggering processes within the Sciara del Fuoco (Stromboli island) by means of numerical modeling”. Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli Chiara Colarusso, “Analysis of Hydrogeological hazard for emergency local admistration planning: the Volterra case study”. Department of Earth Sciences, University of Florence. Tutor: Prof. Nicola Casagli Alessandro Borgioli, “Risk scenarios associated with the Cantoniera di Vetto landslide”. Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli Lorenzo Giardi, “Idrogeomorphological study in the Il Piano area (Rio Marina, Livorno)”. Department of Earth Sciences, University of Florence. Tutor: Prof. Riccardo Fanti Niccolò Galfo, “Electrical tomography and H/V measurements for the reconstruction of the underground context in the il Piano sinkhole area (Rio Marina, Livorno)”. Department of Earth Sciences, University of Florence. Tutor: Prof. Riccardo Fanti. Elena Masi, “Assessment of organic content on some Tuscan slope cover soils and correlation with geotechnical and mineralogical properties”. Department of Earth Sciences, University of Florence. Tutor: Prof. Filippo Catani. Erica Artesi, “Stability analysis of the Sciara del Fuoco and comparison with deformation monitoring data”. Department of Earth Sciences, University of Florence. Tutor : Prof. Nicola Casagli Paolo Gandelli, “Statistical evaluation of slope cover thickness at a basin-scale”. Department of Earth Sciences, University of Florence. Tutor: Prof. Filippo Catani Juliao Andre Mbongo, “Application of an innovative wireless sensor network for monitoring landslide phenomena”. Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli. Francesca Talami, “Numerical modelling of the triggering conditions of the Pianestolla (PR) landslide”. Department of Earth Sciences, University of Florence. Tutors: Prof. Giovanni Gigli; Alessandro Corsini Cipolli Alessio, “Synchronicity of flood events across the Danube river basin”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Enrica Caporali and prof. Fabio Castelli. Co-tutors: Dr. Alberto Viglione and Prof. Juraj Parajka, TU Vienna (Austria). Moncini Francesco, “The serious games to enhance the flood risk perception”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. G.V. Federici Calistri Matteo, “The hydrological and hydraulic modelling of urban scape: the reconstruction of the 1966 flood in Firenze”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. G.V. Federici and prof. Valeriy Ivanov (University of Michigan).

	Melosi Giulio, “Design of a retention basin on Settola creek (Agliana, PT)”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali Luchetta Valentina, “Rainfall and discharge warning thresholds definition for civil protection actions in the city of Florence”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli Alberto Caciolli, Daniele Bartolozzi, “Laboratory experiments on the scour at the Vespucci bridge in the Arno River in Florence”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Luca Solari, prof. Enio Paris. Laura Godone, “Solid transport at regional scale: data analysis and database construction”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enio Paris Simone Moretti, “On the production of woody debris in the Ombrone Grossetano river during the 24 - 25 August 2015 flood event”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Luca Solari, prof. Pier Luigi Aminti D'Aleo Costanza Giovanna “Hydraulic design for flood risk mitigation on Marinella di Travalle creek (FI-PO)”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli Lucioli Elisa, “Evaluation of Topino river floodplains in the Foligno area following the mitigation intervention of flood risk”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli Pampaloni Matteo, “Evaluation of 1D and 2D model for predicting the flood areas of the Marinella creek final reach”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli, Eng. Valentina Chiarello, PhD. Nalesso Riccardo, “The influence of the annual number of storms and the initial soil moisture conditions on the flood frequency curves using a fully distributed hydrological model”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli, prof. Luis Garrote, prof. Alvaro Sordo-Ward, Eng. Ivan Gabriel-Martin. Eleonora Sanesi, “Effects of sea level rise on the bed profile of a lowland river”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutors: Prof. Astrid Blom, TU Delft (Olanda). Francesco Tanganelli, “Experimental study of sorting processes of heterogeneous sediment mixture in low confined flows”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutor: Dr. Alain Recking, IRTSEA Grenoble (Francia). Sara Posi, “River bank protection with bio-engineering techniques: laboratory experiments on the interaction between fascines and sediment erosion”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutor: Dr. Alain Recking, IRTSEA Grenoble (Francia). Marco Castaldi e Cosimo Peruzzi, “Hydraulic Characterization of Ponte Vecchio and the Arno river in Florence”. Department of Civil and Environmental Engineering, University of Florence.Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutor: Prof. Bijan Dargahi, KTH

	Stoccolma (Svezia). **North-East Forestry University, Harbin, China (2 Master):** Shang Xu — Master's Degree School: Civil engineering College, North-East Forestry University, Harbin, China Title: Study on the characteristics of water and salt migration and dielectric constant of foundation soil Meng Jin — Master's Degree School: Civil engineering College, North-East Forestry University, Harbin, China Title: Unsaturated clay freezing process under alternating electric field resistivity change **National Autonomous University of Mexico (4 Master):** Maria Guadalupe Hernández-Moreno School: National Autonomous University of Mexico, Geography postgraduate studies Title: Landslide risk perception in Mexico: a research gate into public awareness and knowledge Marco Antonio Pablo Pablo School: National Autonomous University of Mexico, Geography postgraduate studies Title: Dendrogeomorphological study by debris flow in the municipality of Ixtacamaxtitlán, Puebla, Mexico Felipe de Jesús Juárez Villanueva School: National Autonomous University of Mexico, Geography postgraduate studies Title: Disaster Risk in the municipality of Teziutlán, Puebla: a non-structural diagnosis **Amrita Vishwa Vidyapeetham, India (10 Master):** Deekshit VN (2016), - Context aware landslide detection system using smart geophone sensor networks Radhika M (2016), - Enhanced DTN protocol for IoT based offshore communication Ebin k Thomas (2016) - Mobility aware cooperative spectrum sensing for the maritime network Lakshmi p (2016), - Design and Peru evaluation of localization and tracking algorithm for mobile fishing vessels Anjana MS (2016), - Personalized energy management in buildings Vivek Sai (2017) - Real time landslide monitoring and early warning using electrical resistivity techniques Sreekanth N (2017) - An internet of things based sustainable water management Swathi (2017) - Cyber physical system for real time monitoring of movements triggered due to slope instability Athira Viswanathan (2018) - Feasibility analysis of software defined networks in samrt grid applications

	Gayathri S Menon (2018) - Feasibility analysis and architectural design of continuous service provisioning in IoT application environments using fog computing **University of Ljubljana, Ljubljana, Slovenia (4 Master):** Čajo Duje – MEng School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia Title: Proposal for protective measures against falling stones and rockfalls for the western part of the city of Omiš, Croatia Date of Certification: March 2018 Jakop Urban – MEng School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia Title: Hydrological analysis of floods for the Savinja river watershed Date of Certification: 2017 Oblak Aleš – MEng School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia Title: Comparison of methods for the evaluation of liquefaction potential from in-situ tests Date of Certification: 2017 Petek Manca – Meng School: Faculty of Civil and Geodetic Engineering, University of Ljubljana, Ljubljana, Slovenia Title: Rainfall erosivity analysis in Slovenia Date of Certification: September 2017
ii) Training (short term)	● International school for PhD students and young doctors on "LAndslide Risk Assessment and Mitigation", LARAM School 2018. University of Salerno (ITALY), September 3-14, 2018. The LARAM class of 2018 was composed of 40 selected PhD students (12 from Italian Universities, 12 from other European Universities and 16 from Universities outside Europe) and 4 young doctors (from Turkey, Brazil, Canada and Pakistan). The programme of the School included 59 hours of lessons, 8 hours of tutorials, 3 hours of student presentations and 5 hours of field training. The first edition of the LARAM Honour Lecture, awarded for outstanding contributions in scientific research on landslides and the related risk and educational activities dealing with landslide risk assessment and mitigation, was delivered by Prof. Jordi Corominas from Universitat Politècnica de Catalunya, Barcelona, SPAIN. The other 19 teachers of the School (6 from the University of Salerno, 3 from other Italian Universities, 7 from other European Universities, and 3 from Universities outside Europe) delivered their lectures within the following sessions: S1, Introduction to landslides; S2, Landslide risk theory; S3, Landslide triggering factors; S4, Landslide modelling; S5, International experiences; S6, Landslide risk analysis and zoning; S7, Landslide monitoring and mitigation; S8, Landslide risk management and risk governance. ● IRSM CAS, Prague: 2017, May: training in landslide field monitoring techniques in high mountains, Cordillera Blanca, Peru ● Technical Conference: "New technologies for geohazards risk reduction and cultural heritage protection". Seminar: "Surface Processes in Mountain Enviroments". Held by Dr. Sara Savi

	Institute of Earth and Environmental Science, Universität Potsdam, Germany. Florence, November 9, 2016. ● Technical Seminar: "Slope Stability Analysis Program – SSAP2010 (4.7.8-2016)". Held by Prof. Lorenzo Borselli. Professor of Geotechnics and Applied Geology, Instituto de Geologia, Universitad Autonoma de San Luis Potosì, Mexico. Florence (Italy), November 10, 2016. ● Technical seminar in the framework of the "13th Bamiyan Expert Working Group Meeting", for the Safeguarding of the Cultural Landscape and Archaeological Remains of the Bamiyan Valley. Munich Germany 1-3 December 2016 ● Seminar: "Subsidence and landslides in Mexico". Held by Prof. Víctor Manuel Hernández Madrigal, Instituto de Investigaciones en Ciencias de la Tierra, Universidad Michoacana de San Nicolás de Hidalgo, Mexico. Florence (Italy), December 15, 2016. ● Technical Seminar: "The use of infrared thermography for building safety diagnostics". Istituto Superiore Antincendi (ISA), National Department of Firefighters, Public Rescue and Civil Defense, Rome (Italy), January 24, 2017. ● Technical Seminar: "UAV & SAR: Drones in Rescue Operations". Istituto Superiore Antincendi (ISA), National Department of Firefighters, Public Rescue and Civil Defense, Rome (Italy), March 29, 2017. ● International Scientific Committee UNESCO/Japanese Funds-in-Trust for Strengthening the Conservation and Management of Lumbini, the birthplace of Lord Buddha. Lumbini, Nepal, 17-19 February 2017. ● Seminar: "An Introduction to Climate Change and Downscaling". Held by Dr. Simone Fatichi. Research Associate and Lecturer at the Institute of Environmental Engineering at the ETH Zurich. Firenze (Italy) March 2, 2017. ● Seminar: "Evaluation of scouring reliability at bridge pier foundations". Held by prof. A.Melih Yanmaz of the Dept. of Civil Engineering, Middle East Technical University (Turkey). Firenze (Italy), March 7, 2017. ● Seminar: "Safety in Geotechnical Fieldwork", held by Prof. Eddie Bromhead, Former Professor of Geotechnical Engineering at Kingston University (UK). Florence (Italy), March 9, 2017. ● Conference: "Event and Hydraulic and Geo-Hydrological Hazards scenarios". Held by Prof. Pasquale Versace, director of CAMILab (Laboratory of enviromental Cartography and Geo-Hydrological modelling at the Calabria University), Centre of Competence of the Italian Civil Protection Department. Florence (Italy), March 30, 2017. ● Seminars Cycle: "Climate Change, Water Resources and Hydraulic Risk in Macedonia". Held by prof. Katerina Donevska, Ss Cyril and Methodius University, Skopje (Macedonia). Florence (Italy) 5-6 April 2017. ● Conference: "Geomorfosites and Geotourism in Romania". Held by Dr. Mihaela Verga, Department of Geomorphology, Pedology and Geomatics, University of Bucharest. Florence (Italy), May 10, 2017. ● Workshop: "Innovative survey and monitoring tools for geological and geotechnical analysis and modelling". Held by Giovanni Barla (Polytechnic University of Turin), Giovanni Gigli (DST-UNIFI), Johann Facciorusso (DICEA). Florence (Italy), June 19, 2017. ● Seminar: "The landslide story from Wenchuan earthquake region, China". Held by Xuanmei Fan and Yonghong Luo (State Key Laboratory of Geohazard Prevention and Geoenvironment Protection, Chengdu University of Technology). Florence (Italy), September 26, 2017. ● Workshop: "Knowledge sharing and capacity building on Protection of Cultural Heritage from Geo Hazards". Petra College for Tourism and Archaeology, Al Hussein Bin Talal University, Jordan, 17 November 2017. ● Seminar: "Fusing complex network analytics with granular micromechanics for early prediction of granular failure from kinematical data". Held by Antoinette Tordesilas (School of Mathematics and Statistics, University of Melbourne). Florence (Italy), December 5, 2017.

	● Seminar: “The Methodology for the Conservation and Strengthening of the Rock-Cut Churches and the Drainage System for Monastic Complex of Geghard”. February, 13–16, 2018 Yerevan (Armenia). ● Seminar: “Optical fibers applied for monitoring“. Held by Monica Papini and Laura Longoni (Department of Environmental and Civil Engineering, Polytechnic University of Milan). Florence (Italy), May 14, 2018. ● Seminar: “Characterization and monitoring of rocky slopes throughout 3D point clouds. Past and present experiences in the application of InSAR for the study of land subsidence due to groundwater withdrawal in Spain. Roberto Tomas Jover - Professor at Departamento de Ingeniería Civil - Escuela Politécnica Superior - Universidad de Alicante. Florence (Italy), July 12 2018. ● Seminar: “Similarities and differences between earthquake and rainfall induced landslides”. Held by Binod Tiwari Binod - Professor at Civil and Environmental Engineering Department - California State University – Fullerton. Florence (Italy), 03 September 2018. ● Cycle of lessons: Training on “Geo-Risks” within the official courses "Natural geo-hydrological risks" and "Geomorphology" at the Department of Geography (University of Shkoder "Luigj Gurakuqi", Albania), 11-15 December 2017. ● Training course: "The protection of risks for Cultural Heritage: the technologies applied at the last dinner of Vasari". Lecture at the Postgraduate Course in Economics and Management of Museum and Cultural Heritage. Interdisciplinary training Course under the theme: "Museums, cultural heritage and new challenges: between risk protection and new professionalism". Department of Economics and Business Sciences (University of Firenze, Italy), March 23, 2018. ● Training courses: "Interventions for flood mitigation for Florence and the Santa Croce church" and “preservation of the main cultural heritage in the Basilica of Santa Croce” (with practical exercise). Interdisciplinary training Course for the Protection of Cultural 11Heritage under the theme "prevention and emergency in museums and sites transformed into museum". The course was organized by the Italian Federation of Friends of Museums (FIDAM) of Florence, the Italian Red Cross Committee of Florence and the Italian Society for the Protection of Cultural Heritage (SIPBC - Regional Section of Tuscany) in collaboration with the Opera di Santa Croce, Florence. Basilica of Santa Croce, Florence. May 4-5, 2018. ● ICL net work (ICL-CRLN) at Northeast Forestry University: 2017, August 7-10: training in “Prevention and Control Technology of Geological Environmental Disasters in Expressway Roads area in Northeast Permafrost Region” in Inner Mongolia Traffic Construction Engineering Quality Supervision Bureau, Inner Mongolia, China. ● Amrita University : Community Engagement During the landslide monitoring system deployment period of the project, community level workshops, talks and pamphlets were given to educated the general mass of Sikkim about landslide hazards. - Community engagement strategies adopted: The populated areas of the Monitoring area was divided in lower and upper part, and the community awareness programs were conducted in two sets. Use of visual aids and translated version of the programs and leaflets were made in native languages also to increase the social impact of the awareness program. During these programs the stakeholders such as SSDMA and members of the local governing committee were also include. - Community Engagement Workshops - Stakeholder Engagement- Like Sikkim State Disaster management Authority, Forest Department, Councillor of that area etc. ● Landslide group in National Central University, Chinese Taipei: Jun-Xue Haung (TPE), Truong Nhat Phuang (VIE), Van Binh Bui (VIE), and Viet Khuyen Bui (VIE) to 2018 IRDR ICoE-Taipei training course for Landslide Risk Reduction

iii) Research

The main and common research activities of this network is the projects of the Internatinal Programme on Landslides (IPL) and also activities of ICL World Cenres of Excellece (WCoEs). The list of IPL project and WCoEs are presented here.

IPL-106-2	International Summer School on Rockslides and Related Phenomena in the Kokomeren River Valley, Tien Shan, Kyrgyzstan	Russia	Alexander Strom	2008 -
IPL-112	Landslide mapping and risk mitigation planning in Thailand	Thailand	Saowanee Prachansri	2009 -
IPL-155	Determination of soil parameters of subsurface to be used in slope stability analysis in two different precipitation zones of Sri Lanka.	Sri Lanka	A. A. Virajh Dias	2010 -
IPL-157	Dynamics of subaerial and submarine megaslides	Japan	Kyoji Sassa	2010 -
IPL-158	Development of Community-based Landslide Early Warning System	Indonesia	Teuku Faisal Fathani	2009 -
IPL-159	Development of Education Program for Sustainable Development in Landslide Vulnerable Area through Student Community Service.	Indonesia	Dwikorita Karnawati	2009 -
IPL-165	Development of community-based landslide hazard mapping for landslide risk reduction at the village scale in Java, Indonesia	Indonesia	Dwikorita Karnawati	2010 -
IPL-167	The effect of freezing-thawing on the stability of ancient landslide of North-Black highway	China	Wei Shan	2009 -
IPL-175	Development of landslide risk assessment technology and education in Vietnam and other areas in the Greater Mekong Sub-region	Japan, Vietnam	Kyoji Sassa & Nguen Xuan Khang	2012 -

IPL-179	Database of Glacial Lake Outburst Floods (GLOFs)	Czech Republic	Adam Emmer and Vit Vilimek	2012 -
IPL-181	Study of slow moving landslide Umka near Belgrade, Serbia	Serbia	Biljana Abolmasov	2012 -
IPL-191	Landslide hazard zonation in Carpathian region of Ukraine using GIS	Ukraine	Yakovliev Yevhenii, Oleksandr M. Trofymchuk	2015-
IPL-192	Development of post-earthquake rainfall induced landslide (PERIL) hazard mitigation framework	USA and Nagendra Sitoula, Nepal	Binod Tiwari	2015-
IPL-193	Integrated systems for landslides monitoring, early warning and risk mitigation along motorways	Italy	Pasquale Versace	2015-
IPL-196	Development and applications of a multi-sensors drone for geohazards monitoring and mapping	Italy	Veronica Tofani	2015-
IPL-197	Low frequency, high damaging potential landslide events in “low risk” regions – challenges for hazard and risk management	Czech Republic	Jan Klimeš	2015-
IPL-198	Multi-scale rainfall triggering models for Early Warning of Landslides (MUSE)	Italy	Filippo Catani	2015-
IPL-199	The effect of root systems in natural slope erosion protection in the hill country of Sri Lanka	Sri Lanka	Pvip Perera	2015-
IPL-200	An assessment of the rock fall susceptibility based on cut slopes adjacent to highways and railways	Sri Lanka	H.M.J.M.K. Herath	2015-
IPL-201	Landslide inventory and Susceptibility map in Durres and Kavaja region	Albania	Hasan Kulici	2016-
IPL-202	Ripley landslide monitoring project (Ashcroft, BC, Canada)	Canada	Peter Bobrowsky	2016-

IPL-203	Analysis and identify of landslides based on species distribution and surface temperature difference	China	Ying Guo	2016-	
IPL-205	Integrated systems for landslides monitoring, early warning and risk mitigation along motorways	Italy	Pasquale Versace/Giovanna Capparelli	2016-	
IPL-206	Towards improved landslide mapping and forecasting	Italy	Fausto Guzzetti/Mario Parise	2016-	
IPL-207	Evaluation on social research approach In determining “acceptable risk” and “tolerable risk” in landslide risk areas in Malaysia	Malaysia	Che Hassandi Bin Abdullah	2016-	
IPL-208	Landslide disaster risk communication in mountain areas	Mexico	Irasema Alcántara Ayala	2016-	
IPL-209	Landslides and related sediment disaster project covering the entire South-East Nigeria, West Africa	Nigeria	Igwe Ogbonnaya	2016-	
IPL-210	Massive landsliding in Serbia following Cyclone Tamara in May 2014	Serbia	Biljana Abolmasov	2016-	
IPL-211	Development of wireless sensor network for monitoring and earlier warning of shallow and deep landslides (WISE-LAND)	Indonesia	Adrin Tohari	2016-	
IPL-212	The construction of a global database of giant landslides on oceanic island volcanoes	Czech Republic	Matt Rowberry	2016-	
IPL-213	Real-time Landslide Monitoring and Early warning System in Western Ghats & Himalayas, India	India	Maneesha Vinodini Ramesh	2016-	
IPL-214	Time prediction of an onset of a rainfall-induced landslide based on the monitoring of the deformation and the groundwater level in the slope	Japan	Mitsuya Enokida	2016-	
IPL-215	The development of paleo-landslides in the middle part of the Moskva River valley within the limits of the	Russia	Oleg Zerkal	2016-	

	Moscow City				
IPL-216	Diversity and hydrogeology of mass movements in the Vipava valley, SW Slovenia	Slovenia	Timotej Verbovšek	2016-	
IPL-217	PROTHEGO – PROTection of European Cultural HEritage from GeO – Hazards	Italy	Daniele Spizzichino/ Claudio Margottini	2016-	
IPL-218	Landslide rapid mapping from remote sensing	China	Ping LU	2017-	
IPL-219	Rockfall hazard identification and rockfall protection in the coastal zone of Croatia	Croatia	Željko Arbanas	2017-	
IPL-220	Kostanjek landslide monitoring project (Zagreb, Croatia)	Croatia	Martin Krkač	2017-	
IPL-221	PS continuous streaming for landslide monitoring and mapping	Italy	Federico Raspini	2017-	
IPL-222	Landslide risk analysis and mitigation in the ancient rock-cut city of Vardzia (Georgia)	Italy	Claudio Margottini	2017-	
IPL-223	Landslides in Africa: Understanding catastrophic failures and effective preventive measures in vulnerable regions of the continent	Nigeria	Igwe Ogbonnaya	2017-	
IPL-224	Combination of radar and optical remote sensing for hazard assessment of the potentially river-damming landslides: The cases of the Vakhsh and the and Brakhmaputra Rivers	Russian Federation	Alexander Strom	2017-	
IPL-225	Recognition of potentially hazardous torrential fans using geomorphometric methods and simulating fan formation	Slovenia	Matjaž Mikoš	2017-	
IPL-226	Studying landslide movements from source areas to zone of deposition using a deterministic approach	Slovenia	Mateja Jemec Auflič	2017-	

IPL-227	Development of a web based landslide information system for the landslides in Sri Lanka	Sri Lanka	K M Weerasinghe	2017-
IPL-228	General approach to landslide research and stabilization in Bosnia and Herzegovina	Bosnia and Herzegovina	Sabid Zekan	2017-

List of ongoing the Word Centre of Excellence on Lanslide Disastr Reduction （WCOE）for 2017-2020

No.	WCOE Title	Leader	Country	Organization
1	Landslide Monitoring and Critical Infrastructure	Peter Bobrowsky	Canada	Geological Survey of Canada
2	Scientific research for mitigation, preparedness and risk assessment of Landslides	Yueping Yin	China	China Geological Survey
3	Formation mechanism research, disaster warning, and universal education of landslides in permafrost regions	Wei Shan	China	Institute of Cold Regions Science and Engineering, Northeast Forestry University
4	Center for Applied Landslide Research (CALaR)	Snjezana Mihalic Arbanas, Zeljko Arbanas	Croatia	Croatian Landslide Group from University of Zagreb and University of Rijeka
5	Landslide risk assessment and development guidelines for effective risk reduction – continuation	Vit Vilimek	Czech Republic	Charles University, Faculty of Science & Institute of Rock Structure and Mechanics Czech Academy of Sciences
6	Enhancement of the existing Real-time Landslide Monitoring and Early warning System in Western Ghats & Himalayas, India	Maneesha V Ramesh	India	Amrita University
7	Development of Community-based and Most Adaptive Technology for Landslide Risk Reduction	Dwikorita Karnawati	Indonesia	University of Gadjah Mada
8	ATLaS: Advanced Technologies for LandSlides	Nicola Casagli	Italy	Department of Earth Sciences, University of

					Firenze (DST-UNIFI)
	9	Methods and tools for landslide forecasting and risk mitigation and adaptation strategies	Fausto Guzzetti	Italy	Istituto di Ricerca per la Protezione Idrogeologica (IRPI), of the Italian National Research Council (CNR)
	10	Landslide Hazards Mitigation Programs in the Korean Demilitarized Zone	Sangjun Im	Korea	Korean Society of Forest Engineering
	11	Landslide Quantitative Risk Analysis Study for Malaysia	Che Hassandi Abdullah	Malaysia	Slope Engineering Branch, PublicWorks Department of Malaysia
	12	Landslides Integrated Research for Disaster Risk Reduction	Irasema Alcántara Ayala	Mexico	National Autonomous University ofMexico (UNAM)
	13	Characterizing past and planned activities: Klima 2050 – Innovational methods for risk reduction associated to hydro-meteorologically induced landslides	José Cepeda	Norway	Norwegian Geotechnical Institute (NGI)
	14	Central Asia rockslide inventory. Compilation and analysis	Alexander Strom	Russia	JSC “Hydroproject Institute”
	15	Harmonization of Landslide Data and Local Communities Capacity Building for Landslide Risk Reduction	Biljana Abolmasov	Serbia	University of Belgrade, Faculty of Mining and Geology
	16	Landslides in Weathered Flysch: from activation to deposition	Ana Petkovšek	Slovenia	University of Ljubljana, Faculty of Civil and Geodetic Engineering (ULFGG)
	17	Landslide risk reduction in Slovenia	Mateja Jemec Auflic	Slovenia	Geological Survey of Slovenia
	18	Model Policy Frameworks, Standards, and Guidelines on Landslide Disaster Risk Reduction	A A Virajh Dias	Sri Lanka	Central Engineering Consultancy Bureau (CECB)

19	Characterizing past and planned activities: NBRO is the national focal point for landslide disaster risk management	Asiri Karunawardena	Sri Lanka	National Building Research Organization
20	Implementation of National Slope Master Plan	Oleksander Trofymchuk	Ukraine	The Institute of Telecommunication and Global Information Space (ITIGS) of the National Academy of Science of Ukraine (NASU)

UNESCO Chair at University of Florence:

- U-Geohaz (Geohazard impact assessment for urban areas), ECHO EU-funded project.
- SARA (Search and rescue aid and surveillance using high egnss accuracy), a Horizon 2020 funded project.

Institute of Rock Structure and Mechanics, Czech Academy of Sciences:

- Compilation of the global giant landslides database as part of the IPL212 in 2018.
- Update of the landslide occurrence database based on the web sources for the Czech Republic as part of the IPL 197.
- Preparation of information and teaching brochure “Landslides - underestimated hazard”.

UNESCO Chair at University of Ljubljana:

- Evaluation of intelligent learning techniques for prediction of hydrological data: useful case studies in China and Slovenia (2018-2020 Bilateral project Slovenia – China)
- Stochastic rainfall models for rainfall erosivity evaluation (2018-2019 Bilateral project Slovenia – Germany)

Charles University:

- Case studies in landslide risk areas
- Research of GLOFs (Glacial Lake Outburst Floods) with respect to landslides
- Precipitation analysis of landslide prone areas

Amrita Vishwa Vidyapeetham, India:

For landslide monitoring and early warning, Amrita WNA has initiated research in multiple aspects, they are as follows

- Design of Deep Earth Probe (DEP)
- Field Investigations Using Electrical Resistivity Tomography
- Sensor Systems Design, and Development
- Design and Development of movement sensor
- Design and Deployment of Geophone Network:
- Power System Design and Deployment
- Rainfall threshold model development
- Pore pressure threshold model development
- Forecasting methodologies

	• Decision support system development • Early warning system • Ontology development for landslide prediction from social media • Social media data classification for disaster prediction **Landslide group in National Central University, Chinese Taipei:** • 2018 Cross-Straits Symposium on Engineering Geology

b) Conferences/Meetings
(key conferences and meetings organized by the Chair or to which its Chairholder contributed)

i) Key conferences and workshops hosted by the Chair

ICL-IPL Conference at UNESCO Headquaters in Paris, 15-18 November 2016.

ICL-IPL Kyoto Meeting at the Disaster Prevetion Research Institute, Kyoto University on 5-6 March 2017.

Ad hoc ICL-IPL Meetings at University of Ljubljana, Slovenia on 29 May 2017

The Forth World Landslide Forum (WLF4) at the Lubljana Cutural and Congress Center, Ljubljana, Slovenia from 29 May to 2 June 2017.

ICL-IPL Conference at UNESCO Headquaters in Paris, from 29 November to 1 December 2017.

Ad-Hoc Board of Representative Meeting of the International Consortium on Landslides at ICL Headquarters in Kyoto, Japan with internet web participation on 20 April 2018.

Organization of the ICL-IPL Conference to held at the Disaster Prevetion Research Insititute, Kyoto University and the Natinal Kyoto International Center in Kyoto, Japan on 1- 4 December 2018 is under progress.

UNESCO Chair at University of Ljubljana:

- UNESCO Chair Inaugural Meeting. Ljubljana, 1 December 2016

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence

- Inaugural Meeting: "UNESCO Chair on Prevention and Sustainable Management of Geo-Hydrological Hazards". Florence (Italy), October 27, 2016.
- Conference: "To Florence. The resilience of the art cities to natural disasters". Academy of the Lincei, Rome (Italy), December 10-11, 2016 (All of the major Academies of Sciences of the World have met in Rome and composed an appeal for the protection of Florence).
- Conference: "Water: Science and Culture". Organized in the framework of the World Water Day, with the support of FICLU (Federazione italiana dei Club e Centri per l'UNESCO = Italian federation of Clubs and Centers for UNESCO), Water Right Foundation, and Publiacqua, under the patronage of ICOMOS (International Council on Monuments and Sites). Florence, Italy, March 22, 2017.
- Conference: "Il cinquantesimo dell'alluvione di Firenze del 1966. Un anniversario diverso – The Fiftieth anniversary of Firenze flood event of 1966. A different anniversary". Florence,

Italy, October 31, 2017.

UNESCO Chair: Water, Energy and Disaster Management (WENDI) at Kyoto University

- Kyoto University UNESCO Chair Special Seminar and the Signing Ceremony of the establishmen of UNESCO Chair (WENDI) at Kyoto University Clock Tower Sentenial Hall on 13 February 2018.
- International Inaugural Symposium for UNESCO Chair on Water, Energy and Disaster Management for Sustainable Development at International Science Innovation Building, Kyoto Univesity on 30 July 2018

Amrita Vishwa Vidyapeetham, India:

- Small Satellite Technology for Disaster Management (SSTDM 2016) - The Amrita Center for Wireless Networks and Applications(Amrita WNA) co-hosted an Indo-US workshop with Lockheed Martin Space Systems and CANEUS International on Sensors and Small Satellite Technology for Disaster Management (SSTDM 2016) from August 17th-19th, 2016. The goal of the workshop was to discuss the needs and challenges of SSTDM technologies with a vision to create a collaborative Indo-US SSTDM Center of Excellence. The workshop was co-funded by the Indo-US Science and Technology Forum (IUSSTF).

Landslide group in National Central University, Chinese Taipei :

- 2018 Cross-Straits Symposium on Engineering Geology

ii) Other conferences/organizational activities undertaken by the Chairholder

Institute of Rock Structure and Mechanics, Czech Academy of Sciences:

- Workshop "Engineering-geological survey, preparation, realization and monitoring of transportation roads under landslide risk", 6.6.2017
- Conference "Landslides – underestimated hazard" in the Senate of the Parliament of the Czech Republic, 21.11.2017

UNESCO Chair at University of Ljubljana:

- 3rd Regional Symposium on Landslides in the Adriatic-Balkan Region, Ljubljana, Slovenia, 11-13 October 2017

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence

- Technical Conference: "Historical cities and floods: geology and risk management". Florence (Italy), November 11, 2016.
- Meeting: "Final Meeting of WI-GIM (Wireless sensor network for Ground Instability Monitoring) Life EU project. Innovative technologies for the monitoring of landslide events". Prato (Italy), March 16, 2017.
- Conference: "2017 IPL Symposium on Landslides". UNESCO headquarters, Paris, 29 November 2017.
- Third Joint Seminar Korea-Italy in the framework of the Scientific Bilateral Agreements of the Florence University with Sejong University and KIGAM (Korea Institute for Geosciences and Mining Resources on "Modelling and early warning of landslides, new methods and technologies". Florence (Italy), April 10, 2017.
- Workshop: "Sino-EU Workshop on Remote Sensing Observation and Quantitative Analysis of Landslide Hazard". Tongji University, Shanghai (China), April 17-18, 2017.
- 15th International Symposium on Geo-Disaster Reduction, 25–30 August 2017, Oki Islands - Matsue - Kyoto, Japan

- Fourth World Landslide Forum (WLF4) "Landslide Research and Risk Reduction for advancing culture of living with natural hazards", May 29 -June 2, 2017, Lubiana (Slovenia).
- European Geosciences Union (EGU) General Assembly 2018. Vienna (Austria), April 8–13 2018.
- 16 th International Symposium on Geo-Disaster Reduction, Strasbourg, France, 27-31 2018

North-East Forestry University, Harbin, China:

- International Symposium on Geological Problems of Engineering and Environment in Permafrost Region in the Context of Climate Change & The Third Academic Conference of ICL-Landslides in Cold Regions Network （ICL-CRLN） in Harbin China. 2017.8.9-2017.8.10
- Tech4Dev 2018: Voices of the Global South | 27-29 June 2018, Lausanne, Switzerland - The UNESCO Chair in Technologies for Development's 5th International Conference, Tech4Dev 2018: Voices of the Global South, hosted by the Cooperation and Development Center-CODEV at the Swiss Federal Institute of Technology in Lausanne-EPFL, 27-29 of June 2018, Lausanne, Switzerland.

iii) A selection of conference presentations by the Chairholder and other colleagues

1. Kyoji Sassa. The Sendai Partnerships 2015-2025: Background and Content, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
2. Kyoji Sassa, Yueping Yin and Paolo Canuti. (International Consortium on Landslides (ICL) , 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
3. Kyoji Sassa et al. Landslide Dynamics: ISDR-ICL Landslide Interactive Teaching Tools (LITT) , 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
4. Kaoru Takara. How to Incorporate PMP into Nonparametric Frequency Analysis. 15th AOGS Annual Meeting, Honolulu, Hawaii, USA, 4-8 June 2018
5. Kaoru Takara. Resilient society development under changing climate. Keynote 1 at the 27th UNESCO-IHP Training Course Disaster Prevention Research Institute, Kyoto University, Uji Campus, Kyoto, Japan, 4-15 December 2017
6. Kaoru Takara. Encouraging young researchers through higher education. MIRAI (Multisector Initiative for Research, Action, and Impact) ~ Co-designing social innovation in addressing disaster risks through research action networks~ Japan CSO Coalition for DRR (JCC-DRR) A Technical Session at World Bosai Forum: International
7. Kaoru Takara. Introduction to JASTIP. JASTIP-Net Workshop on Indonesian Proposals for Disaster Prevention (WP4), Bogor, Indonesia, 3 November 2017
8. Kaoru Takara. Meteorological and Hydrological Disaster Risk and international Coopertation. Special Lecture at Croatia Water, Zagreb, Croatia. 06 June 2017
9. Kaoru Takara and Kyoji Sassa. UNESCO-KU-ICL UNITWIN Cooperation Programme for Landslides and Water-Related Disaster Risk Management, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
10. Kaoru Takara. Disaster Prevention Research Institute (DPRI), Kyoto University Including Global Alliance of Disaster Research Institutes (GADRI). The 4th World Landslide Forum, Ljubljana, Slovenia, 29 May - 2 June 2017
11. Kaoru Takara. GADRI: Global Alliance of Disaster Research Institutes. Technical Session/ Side Evet to the HELP Meeting, Ninth Meeting of the High-level Experts and leaders Panel on Water and Disasters, Sichuan University, Chengdu, China, 18-20 May 2017
12. Kaoru Takara. Water-Related Disaster Risk, Disaster Prevention Technology and Policy Research and Various Research and Education at DPRI. Special Lectures for Feng-Chia University at DPRI, Kyoto University, 15-19 May 2017
13. Kaoru Takara. Climate Change and Extremes: Water-Related Disasters in Japan and in the World. BRCC Lecture at UNU. 24 November 2016
14. Qunli Han, Kyoji Sassa, Feng Min Kan and Claudio Margottini. International Programme on

Landslide (IPL): Objectives, History and List of World Centers of Excellence and IPL Projects, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
15. Biljana Abolmasov, Teuku Faisal Fathani, KoFei Liu and Kyoji Sassa. Progress of the World Report on Landslides. , 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
16. Kyoji Sassa and Zeljko Arbanas. Landslides: Journal of the International Consortium on Landslides, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
17. Dinh Van Tien et al. Technical Cooperation Project to Develop Landslide Risk Assessment Technology along Transport Arteries in Viet Nam (IPL-175) , 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
18. Pham Van Tien et al. Simulating the Formation Process of the Akatani Landslide Dam Induced by Rainfall in Kii Peninsula, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
19. Uzuoka, R. Validation of numerical analysis for seismic behavior of unsaturated soil. 2nd Second Pan American Conference on Unsaturated Soils (PanAm-UNSAT 2017)
20. Alcántara Ayala, I., Murray V., Daniels P., McBean G., 2017, On the future challenges for the integration of science into international policy development for Landslide Disaster Risk Reduction, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 – June 2
21. Alcántara Ayala, I., 2017, Landslides and Society, 4 World Landslide Forum, Ljubljana, Slovenia, May 29 - June 2
22. Alcántara-Ayala, I., 2017, Disaster Prevention and Resilient Society, Science and Technology in Society forum, Kyoto, October 1-3rd.
23. Alcántara-Ayala, I., 2017, Geomorphology, Disaster Risk Reduction and Policy Making: on the road to Sendai, 9th International Conference on Geomorphology of the International Association of Geomorphologists (IAG), New Delhi, India, November 6-11, 2017.
24. Sodnik Jošt: Stože landslide triggering simulation using LS-Rapid simulation model, 3rd ReSyLAB, Regional Symposium on Landslides in the Adriatic-Balkan Region, 11-13 October, 2017, Ljubljana, Slovenia.
25. Matjaž Mikoš: Landslide Risk Reduction and the Slovenian National Platform on Disaster Risk Reduction, 3rd ReSyLAB, Regional Symposium on Landslides in the Adriatic-Balkan Region, 11-13 October, 2017, Ljubljana, Slovenia.
26. Matjaž Mikoš: More-Room-for-Water Initiative, International Inaugural Symposium for UNESCO WENDI Chair, Kyoto University, Japan, 30 July 2018
27. Matjaž Mikoš: UNESCO WRDRR and its recent activities, 7th Asia-Europe Meeting Sustainable Development Dialogue on "Sustainable and Integrated Water Management in the 21st Century", Budapest, Hungary, 11-12 September, 2018
28. Veronica Tofani: Development and applications of a multi-sensors drone for geohazards monitoring and mapping, ICL-IPL UNESCO Conference on 15-18 November 2016
29. Nicola Casagli: Advanced Technologies for LandSlides, ICL-IPL UNESCO Conference on 15-18 November 2016
30. Daniele Spizzichino: PROTHEGO - PROTection of European Cultural HEritage from GeO – Hazards, ICL-IPL UNESCO Conference on 15-18 November 2016
31. Veronica Tofani: Landslide monitoring and rapid mapping, Keynote lecture, 3rd Regional Symposium on Landslides in the Adriatic-Balkan Region, 11-13 October 2017
32. Veronica Tofani: PS continuous streaming for landslide monitoring and mapping, ICL/IPL Conference 29 November- 1 December, 2017
33. Nicola Casagli: Advanced Technologies for Landslides (ATLas), ICL/IPL Conference 29 November- 1 December, 2017
34. Daniele Spizzichino: Landslide risk analysis and mitigation for the ancient rock-cut city of Vardzia (Georgia), ICL/IPL Conference 29 November- 1 December, 2017
35. Wei Shan: Geological disasters & environment in Eurasia permafrost regions in the context of climate change, Second Asian Science and Technology Conference For Disaster Risk Reduction Science-policy Dialogue for Implementation of the Sendai Framework in Beijing, China. 17-18 April 2018.
36. Wei Shan: The Monitoring of Soil Pore Water Pressure and Soil Temperature in Cutting Slope before and after Saliva Flow ice, Sino-EU Workshop on Remote Sensing Observation and

Quantitative Analysis of Landslide Hazard, Tongji University, China. May 2017.
37. Wei Shan: Landslide investigations in the northwest section of the Lesser Khingan Range in China using combined HDR and GPR methodsLandslide sliding mechanism and characteristics in permafrost regions of Northeastern China, the 4th Landslide Forum, Lubljanan, Slovenia, 2017
38. Wei Shan: Retrospect and Prospect of Cold Regions Landslide Research Work (2012-2016)--summary of IPL132,IPL167,IPL203,CRLN-Network and WCoe-Research Center of Cold Regions Landslide
39. Lee, Chyi-Tyi (2018) Comparison of landslide susceptibility models trained from inventories of different triggering events in the same basin. 2018 AEG/IAEG Congress in San Francisco, CA, USA.
40. Lee, Chyi-Tyi (2018) New Development in Statistical Landslide Hazard Analysis. AOGS 15th Annual Meeting.
41. Lee, Chyi-Tyi (2018) A Review and Perspectives on the Methodology of Landslide Hazard Analysis. The 5th International Symposium on Mega Earthquake Induced Geo-disasters and Long Term Effects.
42. Lee, Chyi-Tyi (2017) Perspectives of methodology for landslide susceptibility and hazard analysis, the International Conference on Earth Observation and Natural Hazards 2017 (ICEO&NH 2017).
43. Lee, Chyi-Tyi (2017) New development in statistical landslide hazard analysis, Geological Society of Hong Kong 35th Anniversary Conference.
44. 9. Lee, Chyi-Tyi, Fu, C.C. (2017) Cross validation of event-based landslide susceptibility models at the Zengwen Reservoir catchment in southern Taiwan, the 11th Asian Regional Conference (ARC-11) of IAEG.
45. Lee, Chyi-Tyi (2017) Active fault mapping and studies in Taiwan, International Earthquake Cooperation Seminar, Gyeongju, Republic of Korea.
46. 11. Lee, Chyi-Tyi (2017) Construction of national landslide susceptibility/hazard maps in Taiwan, AOGS 14th Annual Meeting.
47. 12. Lee, Chyi-Tyi, Dong, J.J. (2017) Sediment-budget-based Debris-flow Susceptibility, AOGS 14th Annual Meeting.
48. Lee, Chyi-Tyi (2017) Statistical Seismic Landslide Hazard Analysis_A New Update,
49. Lee, Chyi-Tyi (2017) A new concept in seismic landslide hazard analysis for practical application, Geophysical Research Abstracts, 17, EGU2017-11627.
50. Lee, Chyi-Tyi (2017) Common Patterns among Different Landslide Susceptibility Models of the Same Region, World Landslide Forum 4.
51. Yang, C. M., C. H. Hsu, J. J. Dong, Critical displacement of earthquake-triggered catastrophic landslides, 2017/5/29-6/2 WLF4 (The 4th World Landslide Forum) in Ljubljana, Slovenia
52. Wang, Y. F., J. J. Dong, Q. G. Cheng, Velocity dependent frictional weakening of large rock avalanche basal facies: implications for rock avalanche hypermobility? 2017/8/6-11 AOGS, Singapore
53. Yang, C. M., C. C. Tsao, H. Y. Cheng, T. P. Nguyen, C. S. Hsu, W. J. Wu, J. J. Dong, G. H. Wang, X. J. Pei, R. Q. Huang, Revisit the classical Newmark displacement analysis for earthquake-induced wedge slide - The kinematics and initiation of the Daguangbao landslide, 2017/10/14-18 The 4th Slope Tectonics Conference in Kyoto, Japan
54. Chu, H. K., P. S. Lai, J. J. Dong, Inherent and stress-induced anisotropy of hydraulic conductivity around a rock tunnel - equivalent continuum approach, 2017/11/28-30 The 11th Asian Regional Conference of IAEG in Nepal
55. Dong, J. J., Y. W. Lee, Q. V. Pham, C. M. Yang, Apparent steady-state friction coefficient of kaolin clay under different slip rates and drainage conditions, 2018/5/11-18 The 5th International Symposium on Mega Earthquake Induced Geo-disasters and Long Term Effects (2018 MEGE), Chengdu, China
56. Dong, J. J., T. P. Nguyen, C. M. Yang, C. T. Lee, Initiation and kinematics of earthquake-triggered Daguangbao rock wedge slide, 2018/6/3-8 AOGS, Honolulu, Hawaii
57. Dong, J. J., Rapid identification of damming event and hazard assessment of landslide dam - A review, 2018/9/17-21 XIII IAEG Congress - San Francisco 2018
58. Lin, C.-P., Chung, C.-C., Better Practice of Implanting Geo-Nerves for Landslide Monitoring,”

2018 XIII IAEG, 17-21 Sep. San Francisco.
59. Chung, C.-C. Development of Sacrificed Sensors for Rainfall-triggered Shallow Landslide Monitoring, 2018 Asia Oceania Geosciences Society, 4~8 Jun., Hawaii.
60. Chung, C.-C., Guan, C.-R., and Lin, C.-P. A Modified Monitoring Platform with TDR Sensing Capability and Sensor Observation Service, 2017 Asia Oceania Geosciences Society, 7~11 Aug., Singapore.
61. Lin, C.-P., Lin, C.-H., Wu. P.-L., Liu, H.-C., and Chung, C.-C. Integrating Engineering Geophysics into Dam's Assessment, 2017 Asia Oceania Geosciences Society, 7~11 Aug., Singapore.
62. Chung, C.-C. Landslide Monitoring using Time Domain Reflectometry: Case studies, ICCEE-2016, Oct. 17-19, Hiroshima University, Japan.

c) Interuniversity Exchanges/Partnerships
(principal exchanges/partnerships between the Chair and other institution,s including UNESCO Chairs/UNITWIN Networks)

Within 65 ICL full member organizations and 15 associate members, 43 members are from universities. ICL organized the annual meeting and symposium once or twice in 2016, 2017 and 2018, either at UNESCO Headqaurters, Paris, or in Kyoto, Japan. Ths annual meeting is the place for the annual interuniversity exchage including UNESCO

UNESCO Chair at University of Florence:
Memorandums of Understanding exchanged with:

- Charles University, Czech Republic
- Institute of Cold Regions Science and Engineering of Northeast Forestry University
- Project Center on Natural Disaster Reduction of Shimane University
- Department of Geoinformation Engineering, Sejong University
- Korea Institute of Geoscience and Mineral Resources (KIGAM)
- Department of Geoinformation Engineering, Sejong University (South Korea);
- Tongji University, Shanghai (China);
- Charles University (Czech Republic);
- Universidad Michoacana de San Nicolas De Hidalgo, Morelia (Mexico)
- Fujian University of Technology (China);
- Universidade FUMEC - FUndação Mineira de Educação e Cultura, Belo Horizonte, Minas Gerais (Brasil);
- Universidade de São Paulo (Brasil);
- Hanoi University (Vietnam);
- Polytechnic University of Tirana (Albania);
- Ss Cyrill and Methodious University, Skopje (Macedonia);
- University of Belgrade (Serbia);
- University of Novi Sad (Serbia).

ICL Adriatic-Balkan Network (ICL ABN) - regional scientific network of landslide scientists. The Network activities include joint activities related to landslide risk reduction with the scientific and academic institutions from Croatia, Slovenia and Serbia, scientific institutions from Albania and Slovenia, professional association from Bosnia and Herzegovina and local government from Croatia.

ICL Cold Region Landslide Network (ICL-CRLN) - thematic network of landslide scientists. ICL CRLN member consists of universities, scientific and academic institutions from Canada, China, the Czech Republic, Japan, Italy, and Russia. ICL-CRLN mainly focuses on joint activities to reduce the risk of landslides in cold regions in the context of climate change.

Amrita & Politecnico di Milano : Joint center

AMRITA and POLIMI, agree to cooperate in joint scientific investigations in the field "Numerical Simulation of Landslides and Real-time monitoring of Natural Disasters".

The scientific investigations from the side of AMRITA shall be carried out in the Department of Wireless Networking and Applications, those from the side of POLIMI – in the Department of Civil and Environmental Engineering

During the implementation of the present Agreement, the following activities are foreseen and encouraged:

- Staff exchanges
- Theses co-tutoring
- Submission of research proposals to national and international agencies
- Collaborative research

Amrita & CNR, Italy: Joint center

CNR is a research institute of the Italian National Research Council. This joint center is to promote international academic and research co-operation in the following areas:

(a) Institutional exchanges between faculty and researchers from each partner institution;

(b) Organization of training programmes, symposia, conferences, short courses and meetings on research issues in hydrological problems of mutual interest;

(c) Exchange of information, resources and expertise pertaining to developments in hydrometeorological monitoring (ground and satellite observations), flash floods, floods and droughts, groundwater, climate change and natural hazards (floods, landslides, melting glaciers, earthquakes) studies, methodologies, research and innovation;

(d) Acceptance of Amrita graduate students for collaborative research between the Parties for periods of study and/or research; and

(e) Co-operation in any other areas of interest of the Parties, as agreed to by the Parties.

UNESCO Chair at University of Ljubljana:

Memorandums of Understanding exchanged with:

- University of Calabria, Cosenza, Italy
- ZAHW Zurich University of Applied Sciences, Winterthur, Switzerland

leading to master double-degrees in Water Science & Technology and Environmental Engineering. 50+ ERASMUS+ partner institutions in 20 European countries and in Turkey for international students exchange.

Landslide group in National Central University, Chinese Taipei:

- 2016.11 Sate Key Laboratory of Geohazard Prevention and Geoenvironment Protection, ChengDu University of Technology, China
- 2017.12 Sate Key Laboratory of Geohazard Prevention and Geoenvironment Protection, ChengDu University of Technology, China

d) Publications/Multimedia Materials
(major publications and teaching/learning materials)

Please tick relevant fields of output and indicate volume of output:	[tick]	[no.]
Books	■	
Books (edited)	☐	
Books (chapters)	☐	
Monographs	☐	
Research Reports	■	
Journal Articles (refereed)	■	
Conference Proceedings	■	
Occasional Papers	☐	
Teaching/Learning Materials	■	
Multimedia Materials (CD-Rom)	☐	
Multimedia Materials (Video)	☐	
Multimedia Materials (Other)	☐	

Give details of major publications and materials including full citations.

i) Theses

Ph.D theses

PHAM Van Tien (2018) Mechanisms and Hazard Assessment of Landslide-Induced Dams, Kyoto University, Japan

LAM Huu Quang (2018) Development of Hazard Assessment Technology of The Precursor Stage of Landslides, Kyoto University, Japan

Eva Mia Siska (2018) IMPACT OF RAPID DEVELOPMENT GROWTH ON WATER RESOURCES SITUATION IN TOURISM DEPENDENT ECONOMY: A CASE STUDY OF BALI, INDONESIA, Kyoto University

Karlina (2018) ASSESSMENT OF HYDRO-METEOROLOGICAL DROUGHTS RELATED TO ENSO IN LOMBOK AND SUMATRA ISLANDS, INDONESIA, Kyoto University

NGO Doan Dung (2018) Total Management of Landslide Disaster along Main Roads in Tropical Mountain Ranges, Tohoku Gakuin University, Japan

University of Ljubljana:

Sodnik Jošt (2017) Debris flow hazard assessment on torrential fans. University of Ljubljana, Ljubljana, Slovenia

Peternel Tina (2017) Dynamics of the slope mass movements in the Potoška planina with analyses of results of remote sensing and terrestric surveys techniques and in-situ measurements. University of Ljubljana, Ljubljana, Slovenia

Rak Gašper (2017) Water surface topology of supercritical confluence flow. University of Ljubljana, Ljubljana, Slovenia

Zabret Katarina (2018) Influence of meteorological and vegetation parameters on rainfall interception. University of Ljubljana, Ljubljana, Slovenia

University of Florence:

Tania Luti (1st year PhD candidate). “Land monitoring through optical and radar remote

sensingRegional School of Earth Sciences Engineering (XXXIII Cycle). University of Florence: Department of Earth Sciences. Tutor: Prof. Nicola Casagli and Michele Munafo

Monan Shan (1st year PhD candidate). “Permafrost degradation monitoring using time series InSAR technique and its effect on environmental change in northeastern China”. Regional School of Earth Sciences Engineering (XXXIII Cycle). University of Florence: Department of Earth Sciences. Tutors: Prof. Nicola Casagli and Silvia Bianchini

Roberto Montalti (1st year PhD candidate). “Regional scale satellite monitoring for hydrogeological risk reduction”.. Regional School of Earth Sciences Engineering (XXXIII Cycle). University of Florence: Department of Earth Sciences. Tutors: Prof. Filippo Catani

Agnese Turchi (1st year PhD candidate). “Geo-environmental risk analysis for territorial and local sustainable management”. Regional School of Earth Sciences Engineering (XXXIII Cycle), University of Florence: Department of Earth Sciences. Tutors: Prof. Sandro Moretti and Prof. Riccardo Fanti

Teresa Gracchi (2nd year PhD candidate), “Wireless Sensor Networks for landslide Early Warning Systems”. International Doctorate in Civil and Environmental Engineering (XXXII Cycle), University of Florence: Department of Civil and Enviromental Engineering; Department of Earth Sciences. Tutors: Prof. Claudia Madiai and Prof. Nicola Casagli

Mattia Ceccatelli (2nd year PhD candidate), “MOBIDIC hydrologic model implementation for numerical modelling and management of groundwater flow” International Doctorate in Civil and Environmental Engineering (XXXII Cycle). University of Florence: Department of Civil and Enviromental Engineering; Department of Earth Sciences. Tutors: Prof. Fabio Castelli and Prof. Riccardo Fanti

Elena Benedetta Masi (2nd year PhD candidate), “The root reinforcement in slope stability models: root biomass estimation by means of field and remote sensing data”. International Doctorate in Civil and Environmental Engineering (XXXII Cycle). Department of Civil and Enviromental Engineering; Department of Earth Sciences, University of Florence. Tutors: Prof. Enrica Caporali and Prof. Filippo Catani

Laura Pastonchi (3rd year PhD candidate). “Analysis and monitoring of geo-hazards in UNESCO world heritage sites”. Regional School of Earth Sciences (XXXI Cycle). Department of Earth Sciences, University of Florence. Tutor: Prof. Veronica Tofani

Federico Marini (3rd year PhD candidate). “True 3d rockfall analysis from high resolution point clouds”. Regional School of Earth Sciences (XXXI Cycle). Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli

Lorenzo Solari (PhD Thesis Defence April 2018). “Spaceborne radar remote sensing: hydrogeological events monitoring and future developments”. Regional School of Earth Science (XXX Cycle). Department of Earth Sciences, University of Florence. Tutors: Prof. Sandro Moretti; Andrea Ciampalini

Michele D’Ambrosio (PhD Thesis Defence April 2018). “Analysis of slope deposits in Tuscany for applications in the modeling of surface processes and landscape evolution”. Regional School of Earth Science (XXX Cycle). Department of Earth Sciences, University of Florence. Tutor: Prof. Filippo Catani

Tommaso Carlà (PhD Thesis Defence April 2018), “Time-series analysis of monitoring data for early warning purposes”. Regional School of Earth Science (XXX Cycle). Department of Earth Sciences, University of Florence. Tutor: Prof. Nicola Casagli

Matteo Del Soldato (PhD Thesis Defence May 2017). "Integration of field investigations and remote sensing techniques for the assessment of landslide activity and damage". Department of Earth Sciences, Environment and Resources, Federico II University of Napoli; Department of Earth Sciences, University of Florence; Departamento de Ingeniería Civil, Universidad de Alicante. Tutors: Prof. Domenico Calcaterra; Prof. Nicola Casagli; Prof. Roberto Tomas

Giulia Dotta (PhD Thesis Defence April 2017). "Semi-automatic analysis of landslide spatio-temporal evolution". Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli

Teresa Salvatici (PhD Thesis Defence April 2017). "Combining remote sensing techniques with numerical modeling for the runout analysis of shallow rapid landslide". Department of Earth Sciences, University of Florence. Tutor: Prof. Nicola Casagli

Lorenzo Innocenti (1st year PhD candidate). "Modelling wood transport in rivers". International Doctorate in Civil and Environmental Engineering (XXXIII Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Luca Solari

Matteo Isola (2nd year PhD candidate). "Resilience strategies for flood risk management: estimation of damage". International Doctorate in Civil and Environmental Engineering (XXXII Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Enrica Caporali.

Liang Feng (2nd year PhD candidate) "Stability prediction and forecasting of slope of open pit mine". International Doctorate in Civil and Environmental Engineering (XXXII Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutors: Prof. Nicola Casagli and Prof. Grazia Tucci.

Giulio Calvani (3rd year PhD candidate). "Interactions between river morphodynamics and riparian vegetation". International Doctorate in Civil and Environmental Engineering (XXXI Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Luca Solari

Costanza Carbonari (3rd year PhD candidate), "Vertical sorting in gravel bed rivers". International Doctorate in Civil and Environmental Engineering (XXXI Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Luca Solari

Tommaso Pacetti (PhD Thesis Defence May 2018). "Investigating water energy land ecosystem nexus for integrated water resources management". International Doctorate in Civil and Environmental Engineering (XXX Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Enrica Caporali

Chiara Arrighi (PhD Thesis Defence May 2016). "Vehicles, pedestrians and flood risk: a focus on the incipient motion due to the mean flow". International Doctorate in Civil and Environmental Engineering (XXVIII Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Fabio Castelli

Valentina Chiarello (PhD Thesis Defence November 2016). "Analysis with uncertainty of hydrological extreme events". International Doctorate in Civil and Environmental Engineering (XXVIII Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutor: Prof. Enrica Caporali

Pina de Cicco (PhD Thesis Defence May 2017). "Experimental and numerical investigations on wood accumulation at bridge piers with different shapes". International Doctorate in Civil and Environmental Engineering (XXVIII Cycle). University of Florence: Department of Civil and Enviromental Engineering. Tutors: Prof. Luca Solari, Prof. Enio Paris.

North-East Forestry University:

Zhaoguang Hu (2017) The Characteristics of permafrost degradation in Lesser Khingan Mountains of China and its effect on Road subgrade stability. Northeast Forestry University, China.

Yuzhuo Wang (2017) Research on water seepage-drainage geogrid reinforcement mechanism of roadbed under the action of freezing and thawing. Northeast Forestry University, China.

Kun zhang (2017) Erosion and destruction mechanism and electrochemical control of chloride

salt (deicing salt) on concrete structures. Northeast Forestry University, China.

Amrita Vishwa Vidyapeetham, India:

Rekha P (2018) - Context Aware Techniques for Energy Efficient Data Acquisition in Wireless Iot for Disaster Monitoring. R. Prabha, M. V. Ramesh, V. P. Rangan, P. V. Ushakumari and T. Hemalatha, "Energy Efficient Data Acquisition Techniques Using Context Aware Sensing for Landslide Monitoring Systems," in IEEE Sensors Journal, vol. 17, no. 18, pp. 6006-6018, 15 Sept.15, 2017. doi: 10.1109/JSEN.2017.2730225. URL:http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7987684&isnumber=8014453

Landslide group in National Central University, Chinese Taipei :

Ph.D thesis

Song, Zhi-Xuan, Aleatory Variability of Ground-motion Predition Equations Deduced from a Huge Dataset in Taiwan

Master Theses

Yi-Wei Lee (2017) Relationship of frictional characteristics of kaolin clay in different slip rates and drainage conditions

Po-Sung Lai (2017) Inherent and stress-induced anisotropy of hydraulic conductivity around a rock tunnel - equivalent continuum approach

Nguyen Thi Phuong (2018) Static and dynamic analysis of earthquake-triggered wedge failure – from rigid to deformable wedge

Yu-Chen Chen (2018) Frictional and kinematical characteristics of the Hungtsaiping landslide, Taiwan

Jhih-Ruei Guan (2017) A modified monitoring platform with TDR sensing capability and Sensor Observation Service.

Wei-Feng Chien (2017) Improvement of subsidence monitoring using Time Domain Reflectometry.

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王俊皓 Coupling of TRIGRS and TOPMODEL in estimation of groundwater level for shallow landslide prediction

吳沛恩 Landslide, soil erosion and sediment delivery under different typhoon events in the Shihmen reservoir catchment basin

李芝妤 Characteristic of hypsometric curve and scale dependency of hypsometric integral in mountain region of Taiwan

Zong-Han Yang (2016) The Dynamic Responses of Pile with Different upper Structures

Tran Duc Phu (2016) Effect of Vertical Drain Methods on The Soil Liquefaction

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Lin-Mao Hu (2018) Countermeasures for Reducing Embankment Settlement and Deformation Induced by Lateral Spreading

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Chung-Chi Weng (2018) Liquefaction-induced lateral spreading and its effect and mitigation on pile foundations

Tsung-Hsuan Chu (2018) Effect of Vegetation on The Stability of Sandy Slope by Centrifuge Modeling

Ting-Wei Liao (2018) Centrifuge Modeling on Responses of Inclined Sandy Slope During Lateral Spreading

Chia-Sheng Hsu (2018) The Effect on the Mechanical Properties of Sand Improved by Using Biotechnology and Chemistry Methods to Produce CaCO3 Precipitation

Dwi Agrina (2018) Effect of C-RHA Columns on Slope Stability by Centrifuge Modeling.

National Autonomous University of Mexico:

Maria Guadalupe Hernández-Moreno

School: National Autonomous University of Mexico, Geography postgraduate studies

Title: Landslide risk perception in Mexico: a research gate into public awareness and knowledge

Marco Antonio Pablo Pablo

School: National Autonomous University of Mexico, Geography postgraduate studies

Title: Dendrogeomorphological study by debris flow in the municipality of Ixtacamaxtitlán, Puebla, Mexico

Felipe de Jesús Juárez Villanueva

School: National Autonomous University of Mexico, Geography postgraduate studies

Title: Disaster Risk in the municipality of Teziutlán, Puebla: a non-structural diagnosis

Charles University:

Racek O. - Master’s Degree (2018) Landslide susceptibility analysis of Czechia. MSc Thesis, Faculty of Physical Geography and Geoecology, Charles University, Czech Republic.

Olejár F. - Master’s Degree (2018) Stability of volcanic islands in relation to giant landslides on the example of El Hierro Island, Canary Islands. MSc Thesis, Institute of Hydrogeology, Engineering Geology and Applied Geophysics, Charles University, Czech Republic

University of Ljubljana :

Čajo Duje (2018) Proposal for protective measures against falling stones and rockfalls for the

western part of the city of Omiš, Croatia. University of Ljubljana, Ljubljana, Slovenia

Jakop Urban (2017) Hydrological analysis of floods for the Savinja river watershed. University of Ljubljana, Ljubljana, Slovenia

Oblak Aleš (2017) Comparison of methods for the evaluation of liquefaction potential from in-situ tests. University of Ljubljana, Ljubljana, Slovenia

Petek Manca (2017) Rainfall erosivity analysis in Slovenia. University of Ljubljana, Ljubljana, Slovenia

University of Florence

Roberto Montalti, "Quantitative evaluation of conformance to design geometry of open pit excavation works, using high-resolution Lidar data". Department of Earth Sciences, University of Florence, Tutor: Prof. Filippo Catani

Agnese Turchi, "Hydrogeological instability in the basin of the Misa river: which solutions are possible for a more sustainable land management?" Department of Earth Sciences, University of Florence. Tutor: Prof. Riccardo Fanti

Miriana Petrolo, "Assessment of a phisically-based model for shallow landslide forecasting in Valle d'Aosta region". Department of Earth Sciences, University of Florence, Tutor: Prof. Filippo Catani, Veronica Tofani

Damiano Steri, "Application of numerical models for the stability analysis and landslide propagation mechanisms in Sciara del Fuoco (Stromboli, Italy)". Department of Earth Sciences, University of Florence. Tutor : Prof. Nicola Casagli

Simone Giachi, "Terrestrial laser scanning and aerial photogrammetric data comparison for the quantitative characterization of rock masses". Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli

Daniele de Lisa, "Analysis of stress and deformation state related to landslide triggering processes within the Sciara del Fuoco (Stromboli island) by means of numerical modeling".

Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli

Chiara Colarusso, "Analysis of Hydrogeological hazard for emergency local admistration planning: the Volterra case study". Department of Earth Sciences, University of Florence. Tutor: Prof. Nicola Casagli

Alessandro Borgioli, "Risk scenarios associated with the Cantoniera di Vetto landslide". Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli

Lorenzo Giardi, "Idrogeomorphological study in the Il Piano area (Rio Marina, Livorno)".

Department of Earth Sciences, University of Florence. Tutor: Prof. Riccardo Fanti

Niccolò Galfo, "Electrical tomography and H/V measurements for the reconstruction of the underground context in the il Piano sinkhole area (Rio Marina, Livorno)". Department of Earth Sciences, University of Florence. Tutor: Prof. Riccardo Fanti.

Elena Masi, "Assessment of organic content on some Tuscan slope cover soils and correlation with geotechnical and mineralogical properties". Department of Earth Sciences, University of Florence. Tutor: Prof. Filippo Catani.

Erica Artesi, "Stability analysis of the Sciara del Fuoco and comparison with deformation monitoring data". Department of Earth Sciences, University of Florence. Tutor : Prof. Nicola Casagli

Paolo Gandelli, "Statistical evaluation of slope cover thickness at a basin-scale". Department of Earth Sciences, University of Florence. Tutor: Prof. Filippo Catani

Juliao Andre Mbongo, “Application of an innovative wireless sensor network for monitoring landslide phenomena”. Department of Earth Sciences, University of Florence. Tutor: Prof. Giovanni Gigli.

Francesca Talami, “Numerical modelling of the triggering conditions of the Pianestolla (PR) landslide”. Department of Earth Sciences, University of Florence. Tutors: Prof. Giovanni Gigli; Alessandro Corsini

Cipolli Alessio, “Synchronicity of flood events across the Danube river basin”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Enrica Caporali and prof. Fabio Castelli. Co-tutors: Dr. Alberto Viglione and Prof. Juraj Parajka, TU Vienna (Austria).

Moncini Francesco, “The serious games to enhance the flood risk perception”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. G.V. Federici

Calistri Matteo, “The hydrological and hydraulic modelling of urban scape: the reconstruction of the 1966 flood in Firenze”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. G.V. Federici and prof. Valeriy Ivanov (University of Michigan).

Melosi Giulio, “Design of a retention basin on Settola creek (Agliana, PT)”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali

Luchetta Valentina, “Rainfall and discharge warning thresholds definition for civil protection actions in the city of Florence”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli

Alberto Caciolli, Daniele Bartolozzi, “Laboratory experiments on the scour at the Vespucci bridge in the Arno River in Florence”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Luca Solari, prof. Enio Paris.

Laura Godone, “Solid transport at regional scale: data analysis and database construction”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enio Paris

Simone Moretti, “On the production of woody debris in the Ombrone Grossetano river during the 24 - 25 August 2015 flood event”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Luca Solari, prof. Pier Luigi Aminti

D'Aleo Costanza Giovanna “Hydraulic design for flood risk mitigation on Marinella di Travalle creek (FI-PO)”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli

Lucioli Elisa, “Evaluation of Topino river floodplains in the Foligno area following the mitigation intervention of flood risk”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli

Pampaloni Matteo, “Evaluation of 1D and 2D model for predicting the flood areas of the Marinella creek final reach”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli, Eng. Valentina Chiarello, PhD.

Nalesso Riccardo, “The influence of the annual number of storms and the initial soil moisture conditions on the flood frequency curves using a fully distributed hydrological model”. Department of Civil and Environmental Engineering, University of Florence. Tutor: prof. Enrica Caporali, prof. Fabio Castelli, prof. Luis Garrote, prof. Alvaro Sordo-Ward, Eng. Ivan Gabriel-Martin.

Eleonora Sanesi, “Effects of sea level rise on the bed profile of a lowland river”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutors: Prof. Astrid Blom, TU Delft (Olanda).

Francesco Tanganelli, “Experimental study of sorting processes of heterogeneous sediment mixture in low confined flows”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutor: Dr. Alain Recking, IRTSEA Grenoble (Francia).

Sara Posi, “River bank protection with bio-engineering techniques: laboratory experiments on the interaction between fascines and sediment erosion”. Department of Civil and Environmental Engineering, University of Florence. Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutor: Dr. Alain Recking, IRTSEA Grenoble (Francia).

Marco Castaldi e Cosimo Peruzzi, “Hydraulic Characterization of Ponte Vecchio and the Arno river in Florence”. Department of Civil and Environmental Engineering, University of Florence.Tutors: prof. Luca Solari and prof. Enio Paris. Co-tutor: Prof. Bijan Dargahi, KTH Stoccolma (Svezia).

North-East Forestry University, Harbin, China

Shang Xu (2018) Study on the characteristics of water and salt migration and dielectric constant of foundation soil. North-East Forestry University, Harbin, China.

Meng Jin(2018) Unsaturated clay freezing process under alternating electric field resistivity change. NorthEast Forestry University, Harbin, China.

Amrita Vishwa Vidyapeetham, India:

V. Vivek Sai, T. Hemalatha, “Computational methods for simulating soil parameters using electrical resistivity technique”, ICCNT, 2017. DOI http://doi.ieeecomputersociety.org/10.1109/ICCCNT.2017.8204145.

V. V. Sai, T. Hemalatha and M. V. Ramesh, "An affordable non-destructive method for monitoring soil parameters in large scale using electrical resistivity technique," 2017 International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET), Chennai, 2017, pp. 755-761. doi: 10.1109/WiSPNET.2017.8299862. URL: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8299862&isnumber=8299705

Landslide group in National Central University, Chinese Taipei :

Yi-Wei Lee (2017) Relationship of frictional characteristics of kaolin clay in different slip rates and drainage conditions

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李芝妤 Characteristic of hypsometric curve and scale dependency of hypsometric integral in mountain region of Taiwan

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Cheng-Zhe LI (2017) Strength of Buffer Material under Cyclic Loading

Thien-An Nguyen (2017) The Behavior of Flexible Retaining Wall Backfilled by Cohesionless Soil Subjected to Dynamic Loading

Minh-Canh Tran (2017) Centrifuge modelling on failure behaviours of Sandy Slope Caused by Gravity, Rainfall and earthquake

Jia-Jun Xu (2017) Centrifuge shaking table tests on dynamic response of canister surround with buffer material

Maytri Handayani (2017) Effectivity of Biological Cement's Application to Sandy Soil

Lin-Mao Hu (2018) Countermeasures for Reducing Embankment Settlement and Deformation Induced by Lateral Spreading

Ying-Lun Chen (2018) Engineering Properties of Buffer Material under Different Confining Pressures

Chung-Chi Weng (2018) Liquefaction-induced lateral spreading and its effect and mitigation on pile foundations

Tsung-Hsuan Chu (2018) Effect of Vegetation on The Stability of Sandy Slope by Centrifuge Modeling

Ting-Wei Liao (2018) Centrifuge Modeling on Responses of Inclined Sandy Slope During Lateral Spreading

Chia-Sheng Hsu (2018) The Effect on the Mechanical Properties of Sand Improved by Using Biotechnology and Chemistry Methods to Produce CaCO3 Precipitation

Dwi Agrina (2018) Effect of C-RHA Columns on Slope Stability by Centrifuge Modeling.

ii) Publications

Alberti S.; Ferretti A.; Leoni G.; Margottini C.; Spizzichino D. (2017). Surface deformation data in the archaeological site of Petra from medium-resolution satellite radar images and SqueeSAR™ algorithm. JOURNAL OF CULTURAL HERITAGE, 25, 10-20.

Alcántara Ayala, I., 2017, Landslides and Society-a foreword, In: Sassa K., Mikos M. and Yin Y., Advancing Culture of Living with Landslides, Vol. 1. ISDR-ICL Sendai Partnerships 2015-2025, 487-490, Springer.

Alcántara Ayala, I., Murray V., Daniels P., McBean G., 2017, On the future challenges for the integration of science into international policy development for Landslide Disaster Risk Reduction, In: Sassa K., Mikos M. and Yin Y., Advancing Culture of Living with Landslides, Vol. 1. ISDR-ICL Sendai Partnerships 2015-2025, 143-154, Springer.

Alcántara-Ayala, I., 2016, On the multi-dimensions of Integrated Research on Landslide Disaster Risk, In Aversa, S., Cascini, L., Picarelli, L., and Scavia, C. (eds.), Landslides and Engineered

Slopes. Experience, Theory and Practice CRC Press, Balkema, Taylor & Francis Group, 155–168. Volume 1. ISBN: 978-1-138-02989-7.

Alcántara-Ayala, I., and Oliver-Smith, A., 2017, The necessity of Early Warning Articulated Systems (EWASs): Critical Issues Beyond Response, In: Sudmeier-Rieux, K. Fernandez, M., Penna, I., Jaboyedoff, M. and J.C. Gaillard (eds.), Linking sustainable development, disaster risk reduction, climate change adaptation and migration, 101-124, Springer, ISBN 978-3-319-33878-1, ISBN eBook: 978-3-319-33880-4.

Alcántara-Ayala, I., Garnica-Peña, R.J., Domínguez-Morales, L., González-Huesca, A., Calderón-Vega, A. (2017), The La Pintada landslide, Guerrero, Mexico: hints from the Pre-Classic to the disasters of modern times, Landslides1, 14, 3, 277-291.

Allotta B.; Brandani L.; Casagli N.; Costanzi R.; Mugnai F.; Monni N.; Natalini M.; Ridolfi A. (2017). Development of Nemo remotely operated underwater vehicle for the inspection of the Costa Concordia wreck. PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS. PROCEEDINGS PART M, JOURNAL OF ENGINEERING FOR THE MARITIME ENVIRONMENT, vol. 231(1), pp. 3-18.

Antolini F.; Barla M.; Gigli G.; Giorgetti A.; Intrieri E.; Casagli N. (2016). Combined finite–discrete numerical modeling of runout of the Torgiovannetto di Assisi rockslide in Central Italy. INTERNATIONAL JOURNAL OF GEOMECHANICS, vol. 16, pp. 1-16.

Arbanas Ž.; Tofani V. (2017). Introduction: Landslide Monitoring and Warning. In Workshop on World Landslide Forum, 23-31, Springer, Cham.

Arrighi C., Rossi L., Trasforini E., Rudari R., Ferraris L., Brugioni M., Franceschini S., Castelli F. (2018). Quantification of flood risk mitigation benefits: A building-scale damage assessment through the RASOR platform. Journal of Environmental Management, vol. 207, pp. 92-104, ISSN:0301-4797.

Arrighi C.; Brugioni M.; Castelli F.; Franceschini S.; Mazzanti B. (2016). Flood risk assessment in art cities: The exemplary case of Florence (Italy). J. of Flood Risk Management.

Arrighi C.; Oumeraci H.; Castelli F. (2017). Hydrodynamics of pedestrians' instability in floodwaters. Hydrol. Earth Syst. Sci., 21, 515-531.

Baccani C.; Rossi G.; Landini F.; Salvatici T.; Romoli M.; Pancrazzi M.; Focardi M.; Noce V.; Moretti S.; Casagli N. (2018). Optical design of a hyperspectral drone advanced camera for soil monitoring using an electro-optical liquid crystal technology. SPIE Optical Systems Design, 2018, Frankfurt, Germany. Proceedings Volume 10690, Optical Design and Engineering VII; 106900P (2018) https://doi.org/10.1117/12.2311680.

Ballabio C, Borrelli P, Spinoni J, Meusburger K, Michaelides S, Beguería S, Klik A, Petan S, Janeček M, Olsen P, Aalto J, Lakatos M, Rymszewicz A, Dumitrescu A, Perčec Tadić M, Diodato N, Kostalova J, Rousseva S, Banasik K, Alewell C, Panagos P (2017). Mapping monthly rainfall erosivity in Europe. Science of the total environment 579, 1298-1315.

Bandecchi A. E.; Galeazzi G.; Pecori B.; Casagli N. (2017). Laboratori pedagogico-didattici sul rischio idrogeologico a Scienze della Formazione Primaria. Un esempio di integrazione tra ricerca, didattica, tirocinio e professione insegnante. In: Oltre il fare. I Laboratori pedagogico-didattici nel corso di Scienze della Formazione Primaria, Milan, 7-8 April 2016, Edizioni Junior-Bambini Srl, pp. 1-8.

Bardi F.; Raspini F.; Ciampalini A.; Kristensen L.; Rouyet L.; Lauknes T. R.; Frauenfelder R.; Casagli N. (2016). Space-borne and ground-based InSAR data integration: The Åknes test site. REMOTE SENSING, vol. 8, pp. 1-25.

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UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence. “Science for disaster risk management 2017”, Special Volume, realized by the Disaster Risk Management Knowledge Centre of the European Community (Joint Research Center).

e) Cooperation with UNESCO Headquarters, Field Offices

ICL was founded by UNESCO-Kyoto University Joint symposium (IGCP-425 Lanslide Hazard Assessment and Cultural Heritage) in 2002. IPL (International Programme on Landslides) was founded as a landslidle version of IGCP. The Chair of the IPL Global Promotion Committee which manges all of IPL matters, is Qunli Han (the fomer Director of the Ecological Sciences and Earth Sciences of UNESCO, the current Executive Director of the Integrated Research on Disaster Risk (IRDR). The deputy chair is Giuseppe Arduino (Chief Ecohydrology, Water Quality and Water Education Section Division of Water Sciences, of UNESCO). Soichiro Yasukawa Programme Specialist, Coordinator for Disaster Risk Reduction and Resilience, Section on Earth Sciences and Geo-hazards Risk Reduction, Natural Sciences Sector of UNESCO is a focal point of ICL and attended most of ICL meetings and also attend ICL-IPL meeting in Kyoto in 2018. Two sessions for the Fifth World Landslidle Forum held in Kyoto, 2020 have been proposed by UNESCO headquarters and also its Kazakhsan office; 1) Landslides and hazard assessment at UNESCO designated sites, 2) Landslides in Central Asia.

ISDR-ICL Sendai Partnerships 2015-2025 for global promotion of understanding and reducing landslide disaster risk was proposed by ICL under the strong support from UNESCO during the 3rd World Conference on Disaster Risk Reduction in Sendai, Japan. It was established with signing by ICL, UNESCO, Kyoto University, UNISDR, WMO, FAO, UNU, ICSU, WFEO, IUGS ,IUGG, Government of Japan, Italy and Croatia. UNESCO took major role to create the Sendai Partnerhips 2015-2025 and also Dr. Badaoui Rouhban (former Special Advisor to the Assistant Director-General for Sciences of UNESCO) worked as the moderator of the Working Session No.4

"Underlying Risk Factors" of WCDRR and led the adoption of the Sendai Partnerships 2015-2025.

Qunli Han, the former Director of Ecological and Earth Sciences and the current Executive Director of International Research on Disaster Risk (IRDR) has contributed to the International Progamme on Landslides (IPL) as the chair of the Global Promotion Committee of the IPL from 2014 to present.

Irina Bokova, Director General of UNESCO attended the Third World Landslide Forum and handed over the certificates to the leaders of World Centre on Excellence in 2014, and wrote a Foreword to the five voumes of books of WLF4 "Advncing Culture of Living with Landslides".

Vol.1 Sendai Partnerships 2015-2025 is free online book as well as print book for the Fourth World Landslide Forum. UNESCO headquarters published an article "UNESCO's contribution to the implementation of UNISDR's global initiative and ICL" in it. This book downloaded free of charge from the world. The download of ths books is from its publication in May 2017 to 30 September 2018 is 230,467.

Flavia Schlegal, Assistant Director-General of UNESCO for Natural Sciences wrote a forword "Foreword for the ISDR-ICL Landslide Interactive Teaching Tools" to two volumes of full color teaching tooks with PPT for lectuers and PDF online as an important part of the ISDR-ICL Sendai Partnerhips 2015 - 2015.

ICL, UNESCO and others based on UNITWIN Netwrok will organize the Fifth World Landslide Forum in Kyoto, Japan, on 2-6 November 2020. ICL will ask UNESCO to write a foreword for the planned seven volumes of books. UNESCO will contribute to organize two sessions in WLF5;
1) Landslide hazrd assessmen for UNESCO designated sites proposed by Qunli Han and Soichro Yasukawa,, 2) Landslides in Central Asia which was proposed by Kristine TOVMASYAN and Soichro Yasukawa.

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence

The Chair partecipates to several national and international missions, in collaboration with UNESCO and official partners, to promote the protection of the World's cultural heritage threatened by geo-hydrological hazards, some of which part of the UNESCO World Heritage list, especially in developing countries: Afghanistan (Bamyan, Herat, Shar-E-Zohak), Kyrgyzstan, Mongolia, Georgia (Vardzia and Katskhi), Giordania (Petra), Egypt, Ethiopia (Lalibela), Madagascar (Antananarivo), North Korea (Kogurio), Myanmar (Kyaiktiyo Pagoda), Nepal (Lumbini), Bolivia (Tiwanaku), Chile (Rapa Nui, Easter Island).
Hereafter a detailed description of the missions and activities of cultural heritage protection carried out in the last two years:

- October 19-22, 2016: thermographic surveys of the Vardzia monastery (Georgia), on behalf of the National Agency for Cultural Heritage Preservation of Georgia (NACHPG) in the framework of a feasibility project developed with the support of ISPRA (Italian Institute for Environmental Protection and Research), aimed at assessing the stability conditions of the Vardzia monastery slope area.
- February 19, 2017: International mission in Nepal for the conservation and management of Lumbini, the birthplace of Lord Buddha.
- March 7, 2017: Radar satellite data analysis and field survey following the failure of an earth retaining wall at the Medici Villa of Poggio a Caiano in Tuscany (part of the UNESCO World Heritage List).
- April 15-22, 2017: Joint mission with ISPRA personnel for laser scanning survey in the archeological site of Tiwanaku (Bolivia), for the analysis of instability phenomena in the framework of the project: "Preservacion y conservacion de Tiwanaku y la Piramide

de Akapana, Bolivia“, in collaboration with UNESCO Quito on behalf of the Japanese Government.

- June 16-22, 2017: Joint mission with ICL members in Myanmar in the sites of: i) the Kyaiktiyo Pagoda (Golden Rock) for the preservation of the religious cultural heritage and protection of tourists and the faithful; ii) the urban area of Hakha (capital of Chin State) for the protection of the population life and the socio-economic development of the entire community.
- July 15-18, 2017: thermographic surveys of the Vardzia monastery (Georgia), on behalf of the National Agency for Cultural Heritage Preservation of Georgia (NACHPG) in the framework of a feasibility project developed with the support of ISPRA (Italian Institute for Environmental Protection and Research), aimed at assessing the stability conditions of the Vardzia monastery slope area.
- August 25 - September 5, 2017: joint mission in Villa de Independencia (Bolivia) with the personnel of Universidad Mayor de San Simòn de Cochabamba (Bolivia and the Newcastle University (UK), in the framework of GEO-RAMP Project (GEOhazards - Risk Assessment, Mitigation and Prevention) for analysis of landslide phenomena by means of field surveys and geophysical investigations.
- September 23-30, 2017. Joint mission with ISPRA personnel in the archeological site of Tiwanaku (Bolivia), for the analysis of instability phenomena in the framework of the project :“Preservacion y conservacion de Tiwanaku y la Piramide de Akapana, Bolivia“, in collaboration with UNESCO Quito on behalf of the Japanese Government (Implementation of mitigation measures along a pilot with use of small gabions).
- October 7-15, 2017: joint mission with UNESCO and IMV (Institut des Métiers de la Ville) Tana personnel aimed at the geo-hydrological risk assessment in Antananarivo (Madagascar), for the protection and conservation of the historical Upper Town.
- December 11-15, 2017: series of lessons and field surveys for geo-hydrological risk prevention in Albania at the Luigj Gurakuqi University (Scutari).
- February 13-16, 2018: field survey and preliminary hydro-geological hazard assessment Monastery of Geghard and the Upper Valley of the Azat river (Armenia) in the framework of the conference “The Methodology for the Conservation and Strengthening of the Rock-Cut Churches and the Drainage System for Monastic Complex of Geghard”.
- April 23-27, 2018. Joint mission with ISPRA personnel in the archeological site of Tiwanaku (Bolivia), for the analysis of instability phenomena in the framework of the project: “Preservacion y conservacion de Tiwanaku y la Piramide de Akapana, Bolivia“, in collaboration with UNESCO Quito on behalf of the Japanese Government.

Northeast Forestry University:

1) Key Projects of Foreign Cultural and Educational Experts “Environmental Geology and Engineering Geological Problems in the Permafrost Regions of High Altitude Areas in Northeast China under Climate Change” ,invitation Prof. Nicola Casagli, University of Florence, Italy.

2). Key Projects of Foreign Cultural and Educational Expert Schools: " Relationship between Permafrost Degeneration and Vegetation Response in Permafrost at High Latitudes in Northeast China” invitation Dr. Leibman Marina, Institute of Earth Cryosphere, Siberian Academy of Sciences, Russia.

3).Key Projects of Foreign Cultural and Educational Experts: “Engineering Geological Problems in Bridge Construction in High-latitude Permafrost Regions in Northeast China” invitation Dr. Marten Geertsema, British Columbia Forest Service, Canada.

Amrita University:

- Participated in the ICL-IPL UNESCO Conference held in Paris on 15-18, November-2016
- PArticipated in the WLF-4 held in Slovenia, from May-29-June-2, 2017
- World Centre of Excellence Award for 2017-2021 for Landslide Disaster Risk

Reduction[3] - The title, from the International Program on Landslides (IPL) was conferred at the fourth World Landslide Forum in Ljubljana, Slovenia, which the University will hold till 2020.

f) Other
(any other activities to report)

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of Florence: The Earth Sciences Department of the University of Firenze (UNIFI) is the official Centre of Competence of the Italian Civil Protection for Remote Sensing and Geohazards (Directive of the Italian Prime Minister of 27 February 2004; Decree of the Head of the Italian National Civil Protection Department no. 252 of 25 January 2005); this achievement was confirmed four consecuive times: in 2006, 2007, 2011 and 2013 respectively.

Amrita University :

Landslides Early Warnings during 2018 Kerala Flood:

Data from our WSN based landslide monitoring system showed possible conditions for landslides and landslide warnings were issued on July-12, August-09 and August-15 2018 respectively. After the July-12 the warning, there were two landslide incidents in Munnar. After the August-09 warnings, there were 4 debris flow and landslide incidents in and around the deployment site and 2 landslide incidents in Munnar. After the warnings on 15-August-2018, there was a top layer soil slips in our deployment site, and 3 landslide incidents in Munnar.

"Amrita Kripa" rescue APP during 2018 Kerala Floods:

As a response to the massive floods in Kerala in 2018, we a team from Amrita Vishwa Vidyapeetham has launched an Android app for disaster management. Amrita Center for Wireless Networks and Applications - (AmritaWNA) launched an Android app named 'AmritaKripa' to connect survivors with relief and rescue service providers during the massive floods in Kerala.

The app allows users to both request for and offer rescue, medical help, shelter and supplies such as food, clothing and medicine, as well as services such as water, electricity and telephone. One can also report people missing, people found orphaned, either conscious or unconscious, or dead through the app. The app, which is available in Malayalam and English, uses real-time GPS data to locate users. Amrita Vishwa Vidyapeetham is also conducting research on the use of computer vision algorithms to estimate te depth of flood waters based on photos taken from the field.

3. Future Plans and Development Prospects:
Outline of action plan for the next biennium and short/medium and long-term development prospects. Please do not hesitate to refer to difficulties that the Chair has experienced
(Not exceeding 300 words)

ICL headquaters.

Members of the UNITWIN Cooperation Programme are now making efforts to estblish a new long-term and wide -ange global framework to develop the ISDR-ICL Sendai Partnerhips 2015-2025. The

full title of this initiative is shown below.

Kyoto 2020 Commitment

for Global Promotion of Understanding and Reducing Landslide Disaster Risk

To the ISDR-ICL Sendai Partnerships 2015-2025, the Sendai Framework for Disaster Risk Reduction 2015-2030 and the 2030 Agenda Sustainable Development Goals

The Sendai Partnerhship 2015 - 2025 has beeen very successful to promote the globla landslide risk reduction. Howeve, it will be terminated in 2015. The Parnterhips was singed by 22 orgnaizations from United Nation Organizations, Gobal NGO (ICSU, WFEO, IUGS, IUTT etc) and goverment organizations. We wish to create a wider network of all types of landslide related organizations including national and small orgnizatins, and private scetors from developping countries as well as developed countries and also a longer framework.

Then, ICL created to ICL associates (20 % membership fee of the ICL full members), namely 200, 400, 600 USD from 2018 and add 100 USD from 2019. ICL publishes fulll color monthly journal « Landslides ». It will publish 2500 pages/year. The impact factor of this journal in 2017 was 3.811 released by Thomson Reuters and CiteScore released by Elsevier was 4.03. This value was No.1 rank for 36 journals in the field of Engineering, Geological of the Impact Factors, and No.1 for 175 journals in the field of Geotechnical Engineering and Engineering Geology of the CiteScore.

ICL has created a new category « News/Kyoto Committment » from March 2018. To this category, all ICL members (full members, associated members and suppoters) and also ICL supporting organizations can contribute their activity reports and the annoucement of news of meeting contributing to Kyoto 2020 Commitment (KC2020). Namely this monthly jornal is the central platform for global cooperation activities of Kyoto Commitment. All members can receive the Jounal free of charge. ICL and UNITWIN network colleagues and IPL Glboal Promotion Committee will organize World Landsldie Forum evey three years. At eath Forum, members will review the previous activities of KC2020, and up date the priority actions of KC2020 and the participating members. The content and members of KC2020 will be updated every three years. But the members will agree with the updated KC2020, it will be extend another three years. So the ending time is not decided.

15 new organizations has already joined ICL as ICL associates in the period of March to September 2018. We will create 100 USD associate members for low income countries from 2019 to create this network to smaller organizations in low income countries. KC2020 is a development prospects of this network.

University of Ljubljana, Ljubljana, Slovenia :

In order to celebrate the 100th Anniversary of the University of Ljubljana in 2019, UL FGG, Ljubljana, Slovenia will, together with Slovenian Chamber of Engineers, organise the World Construction Forum to be held in Ljubljana, Slovenia from April 8 to 11, 2019 – the WCF2019 Motto is “Buildings and Infrastructure Resilience”, one Forum Theme is “Disaster Risk Management & Governance for Resilient Communities”, and the Forum contributes to 6 Sustainable Development Goals.

Supporting organisation of the 4th Regional Symposium on Landslides in the Adriatic-Balkan Region to be held in Sarajevo, Bosnia and Hercegovina in October 2019.

UNESCO Chair at University of Ljubljana will be further supporting the activities of the national UNESCO Commission, especially within the International Hydrological Programme (IHP), also while being an active member of CUAHSI (Consortium of Universities for the Advancement of Hydrologic Science – www.cuahsi.org), and will contribute to the International Research Society INTERPRAEVENT (www.interpraevent.at), based in Klagenfurt, Austria.

UNESCO CHAIR: Prevention and Mitigation of Geo-hydrological Hazards at University of

Florence

The activities foreseen for the next biennium will be in line with the UN 2030 Agenda for sustainable development and Sustainable Development Goals and with the UNISDR Sendai Framework (2015-2013). In particular, these will include:

- To promote the development of innovative technologies for the prevention and mitigation of geo-hydrological hazards with special emphasis to research and technological development and transfer of knowledge through the organization of stakeholders workshop on geo-hydrological hazards assessment;
- To develop tools and procedures for supporting risk reduction policies and emergency management for the safety of human life through the development of early warning systems and toolkit for disaster response preparedness. Both these objectives will be achieved by managing and developing the current projects and partnerships with scientific institutions, research centers, public administrations and technical stakeholders for research and innovation
- To promote the protection of cultural heritage threatened by geo-hydrological hazards trough scientific mission in less developed countries and capacity building thanks to short-term training and practical filed training. This activity will include the update, check, management and implementation of the mitigation measures for geo-hydrological hazard reduction in all the Cultural Heritage sites under investigation.
- To promote research and training at international level by hosting more workshops, conferences and seminars, as well as by offering scientific facilities to post-graduated students and visiting researchers through scientific networking and professional training and continuous risk reduction.
- To update, integrate and improve the Landslide Dynamics - ISDR-ICL Landslide Interactive Teaching Tools, based on feedback from users and on experiences obtained during its application.
- To contribute to the networking activity by organizing of the 5th World landslide Forum (WLF5), to be held in Kyoto (Japan), November 2-6, 2020.

Northeast Forestry University:
It is planned to hold "Academic seminar on engineering geology and environmental geology in the permafrost region along the "Sino-Russian- Mongolian economic corridor" under the background of climate change".
Collaborating with network members to apply for international projects.

Amrita University:

- Will be contributing to the CD session in Fifth World Landslide Forum
- Will be participating in the 2018 ICL-IPL Kyoto Conference to examine CD sessions and other programme of WLF5

Appendix:

1) Human Resources

Disaster Prevention Research Institute, Kyoto University (host institution)
Kaoru Takara: Professor, Disaster Prevention Research Institute, Kyoto University
Ryosuke Uzuoka: Professor of the Disaster Prevention Research Institute, Kyoto University.

International Consortium on Landslides (ICL)

ICL consists of ICL headquarters and 65 full member organizations, 15 assiciate member organizations and 14 supporters, total 94 orgnaizations.
Disaster Prevention Resarch Institute, Kyoto Univesity and ICL headquarters are regarded as the host institution. 65 full member organizations except the Disaster Prevention Research Institute, Kyoto University and 15 ICL Associates are regarded as partner institutions.
This report includes ICL headquarters and major member organizations of ICL.

ICL Headquarters (host institution)
Kyoji Sassa: Professor Emeritus, Secretary General (Landslide Dynamics)
Kaoru Takara: Professor-Dean, Kyoto University (Hydrology and Hydrogeology)
Kazuo Konagai: Professor Emerigus, Principal Researcher (Civil Engieering)
Hirotaka Ochiai: Doctor-Auditor and researcher (Landslide Monitoring)
Khang Dang: Research Promotion Officer (Landslide Dynamics)
Kiyoharu Hirota: Information officer (Geology)
Mie Ueda: Secretary for ICL-IPL management
Ngoc Pham : Secretary for membership service.
Salvano Briceno: ICL Senior advisor
Badaoui Rouhban: IPL advisor.
Satoru Nishikawa: ICL advisor
Ikuo Towhata: ICL-Japan advisor

UNESCO Chair University of Florence (ICL World Centre of Excellence, UNITWIN Partner Institution)
UNESCO Chair holder: Paolo Canuti
Full Professor – UNESCO Chair Associate: Nicola Casagli
Full Professor – UNESCO Chair Associate: Carlo Alberto Garzonio
Full Professor – UNESCO Chair Associate: Giorgio Valentino Federici
Full Professor – UNESCO Chair Associate: Enio Paris
Full Professor – UNESCO Chair Associate: Fabio Castelli
Full Professor – UNESCO Chair Associate: Sandro Moretti
Associate Professor – UNESCO Chair Associate: Filippo Catani
Associate Professor – UNESCO Chair Associate: Massimo Rinaldi
Associate Professor – UNESCO Chair Associate: Enrica Caporali
Associate Professor – UNESCO Chair Associate: Luca Solari
Associate Professor – UNESCO Chair Associate: Riccardo Fanti
Associate Professor – UNESCO Chair Associate: Giovanni Gigli
Assistant Professor – UNESCO Chair Associate: Veronica Tofani
Adjunct Professor – UNESCO Chair Associate: Ignazio Becchi
Adjunct Professor – UNESCO Chair Associate: Claudio Margottini
Adjunct Professor – UNESCO Chair Associate: Daniele Spizzichino
The Unesco staff is supported by 36 UNESCO Chair Research Assistant

Northeast Forestry University (ICL World Centre of Excellence, UNITWIN Partner Institution)

Wei Shan: Professor Dr. (Hydrogeology and Engineering Geology)
Ying Guo: Associate Professor Dr. (Soil physics and soil mechanics)
Yanqiu Xing: Professor Dr. (Remote Sensing Geology)
Chengcheng Zhang: Engineer Dr. (Geophysics)

Croatian Landslide Group (ICL World Centre of Excellence, UNITWIN Partner Institution)
Željko Arbanas: Professor (Soil Mechanics and Geotechnical Engineering)
Snježana Mihalić Arbanas: Professor (Engineering Geology)
Vedran Jagodnik, Assistant Professor (Soil Mechanics and Geotechnical Engineering)
Sanja Dugonjić Jovančević, Assistant Professor (Soil Mechanics and Geotechnical Engineering)
Martin Krkač, Assistant Professor (Engineering Geology)
Martina Vivoda, Postdoc Researcher (Soil Mechanics and Geotechnical Engineering)
Sanja Bernat, Researcher (Engineering Geology)
Petra Đomlija, Researcher (Engineering Geology)
Marin Sečanj, Researcher (Engineering Geology)
Josip Peranić, Researcher (Soil Mechanics and Geotechnical Engineering)

Geotechnical Engineering Group, University of Salerno (UNITWIN Partner Institution)
Michele Calvello, Associate professor (Geotechnical Engineering)
Sabatino Cuomo, Associate professor (Geotechnical Engineering)
Settimio Ferlisi, Associate professor (Geotechnical Engineering)
Dario Peduto, Associate professor (Geotechnical Engineering)

National Autonomous University of Mexico (UNAM)
Irasema Alcántara-Ayala: Professor, Institute of Geography, landslides, Integrated research on disaster risk
Ricardo Garnica-Peña: Landslide researcher, Institute of Geography,
Ana Rosa Moreno: Professor, Faculty of Medicine, Disaster risk communication
Karina Landeros-Mugica: Researcher, Faculty of Psychology, Risk perception
Javier Urbina-Soria: Professor, Faculty of Psychology, Risk perception

Czech Landslide Group (ICL World centre of Excellence, UNITWIN Partner Institution)
Josef Stemberk (Engineering Geology)
Vít Vilímek (Geomorphology)
Jan Klimeš (Engineering Geomorphology)
Jan Blahůt (Engineering Geomorphology)
Jan Balek (Engineering Geomorphology)

UNESCO Chair University of Ljubljana (ICL World Centre of Excellence, UNITWIN Partner Institution)
Matjaž Mikoš: Professor – Chair holder
Mitja Brilly: Professor (Hydrology)
Ana Petkovšek: Associate Professor (Engineering Geology)
Janko Logar: Associate Professor (Geotechnical Engineering)
Mojca Šraj: Associate Professor (Hydrology)
Marko Komac: Adjunct Professor (Geology)
Simon Rusjan: Assistant Professor (Hydraulic Engineering)
Dušan Petrovič: Assistant Professor (Geodetic Engineering)
Matej Maček: Assistant Dr. (Geotechnical Engineering)
Dejan Grigillo: Assistant Dr. (Geodetic Engineering)
Nejc Bezak: Assistant Dr. (Hydrology)
Jošt Sodnik: Lecturer (Hydraulic Engineering)
Klaudija Sapač: PhD Student (Hydrology)
Katarina Sirk: PhD Student (Geotechnical Engineering)

Landslide group in National Central University from Graduate Institute of Applied Geology, Department of Civil Engineering, Center for Environmental Studies. Chinese Taipei

Ray-Shyan Wu Professor (Water Resource Engineering)
Yong-Ming Tien Professor (Geotechnical Engineering)
Jin-Hung Hwang Professor (Geotechnical Engineering)
Chyi-Tyi Lee Professor (Engineering Geology)
Jia-Jyun Dong Professor (Engineering Geology)
Chuen-Fa Ni Professor (Engineering Geology)
Hsien-Ter Chou Professor (Water Resource Engineering)
Ming-Hsu Li Professor (Water Resource Engineering)
Shu-Kun Hsu Professor (Oceanography)
Chung-Pai Chang (Remote Sensing)
Tso-Ren Wu Associate Professor (Water Resource Engineering)
Wen-Chao Huang Associate Professor (Geotechnical Engineering)
Wen-Yi Hung Associate Professor (Geotechnical Engineering)
Chih-Chung Chung Assistant Professor (Geotechnical Engineering)

2) Financial Resources

Please tick sources of financial contribution and specify the amount in U.S. dollars

	[tick]	Amount ($)
Host Institution	☒	**404,000**
Partner Institution	☐	
Government Body	☒	**7,649,253**
Other Public Institution/Body (incl. Research Councils)	☐	
UNESCO	☒	**108,000**
Other UN Agency	☐	
IGO	☒	**2,881,731**
NGO	☐	
Industry	☒	**1,332,606**
Other Private	☐	

Give details of financial contributions, material resources and space.

A: Financial resources of ICL headquarters and some of major member organizations within 65 members for the current two years

ICL headquarters
ICL Budget for landslide reseach and education :310,000 USD
UNESCO Budget for WLF4: 8,000 USD

Disaster Prevention Research Institute, Kyoto University
Government Body: 86,000 USD
Inter-Graduate School Program for Sustainable Development and Survivable Societies (Global Survivability Studies - GSS)

UNESCO Chair University of Florence

Government Body (333,253 USD)
National Service of Civil Protection
European Union (881,731 USD)
R&D Projects
Industry (132,606 USD)
Private companies

Northeast Forestry University
Government Body (230,000 USD)
Ministry of Communications of China, Department of Transportation of Heilongjiang Province
Tahe County People's Government of Heilongjiang Province
The National Natural Science Foundation of China
Industry (200,000 USD)
Northeast Forestry University Engineering Consulting & Design Institute

UNESCO Chair University of Ljubljana
Direct financial resources for UNESCO Chair are only available as a part of the UL FGG activities financed by the National UNESCO Commission (part of in total 100,000 USD)
Government Body (UL FGG overall budget for teaching 7 million USD)
European Union (UL FGG for projects 2 million USD)
R&D Projects, mainly through Slovenian Research Agency (UL FGG for research projects and early stage researchers 2 million USD)
Industry (UL FGG roughly 1 million USD)

B1: Material resources and space of the above organizations selected from 65 member organizations.

ICL headquarters
A: Major facilities provided by ICL to UNITWIN Programme are:
1) Undrained dynamic loading ring shear apparatus for large-scale landslides which was developed by UNITWIN programme (400,000 USD) for landslide hazard assessment with support of SATREPS (Science and Technology Research Partnerships for Sustainable Development) programme with Vietnam.

2) Transportable undrained dynamic loading ring shear apparatus for smaller landslides landslides which was developed by UNITWIN programme (350,000 USD) for landslide hazard assessment with support of SATREPS (Science and Technology Research Partnerships for Sustainable Development) programme with Vietnam.
which was developed by UNITWIN programme (300,000 USD) for landslide hazard assessment with support of SATREPS (Science and Technology Research Partnerships for Sustainable Development) programme with Croatia.

3) **Facilities at UNESCO Chair in Florence**: GIS and thematic mapping laboratory,cRemote Sensing laboratory specialised on SAR interferometry, optical and hyperspectral remote sensing.
Rock and Soil mechanics laboratory. Patented drone multicopter. Remotely controlled underwater vehicle. Ground-based radar interometer.

4) Facilities at Institute of Cold Regions Science and Engineering(ICRSE) in Northeast Forestry University, China: ICRSE has two parts, ICRSE research center(ICRSE-RC) and ICRSE field observation stations(ICRSE-FOS).The facilities in ICRSE-RC mainly are low-temperature laboratory(20m2),automatic monitoring systems of soil temperature and moisture, triaxial and consolidation instruments and other indoor test equipment, ground penetrating radar, high-density electrical instrument, small rig, light touch detector, unmanned aerial vehicles. The facilities in ICRSE-R are automatic weather stations, automatic monitoring and transmission systems of soil

temperature and moisture.

B2: Space provided to UNITWIN Programme.

Spaces at UNITWIN Headquarters in Kyoto, Japan

1) UNITWIN Headquarters Building which was jointly constructed by ICL and Kyoto University in the Kyoto University Uji campus and donated to Kyoto University in 2004.
   It has three rooms, a meeting rooms for 30 persons, a IPL research room for 5 persons, and a joint research and the editorial room for the journal *Landslides.*
2) UNITWIN Laboratory which is located in Kyoto University Main Campus, Kyoto Japan. The main facilities are two undrained dynamic loading ring shear apparatuses. All students and trainees from Vietnam, China, Indonesia, Pakistan, Croatia and others as well as Japan under the UNITWIN programme have implemented landslide experiments and writing thesis for Doctors and Masters in Kyoto Universiy and other network universities.
3) ICL headquarters which is located in a side of the Kyoto University North campus. A room for UNITWIN Coordinator from ICL and the research promotion office and two secretaries who promote and manage the International Programme on Landslides, and a meeting room for 20 persons.

Spaces at UNESCO Chair in Florence:

1) UNESCO Chair Headquarters Building in the University of Florence Campus of Arcetri with offices for 25 researchers and meeting room for 20 persons
2) Civil Protection Laboratories in the University of Florence Campus of Arcetri with 400 sqm of labs and a conference room for 40 persons
3) Engineering Geology Group in the University of Florence main Campus of Arcetri with offices and labs for 25 researchers

Spaces at UNESCO Chair in Ljubljana: 1) UNESCO Chair is hosted by the Faculty of Civil and Geodetic Engineering of the University of Ljubljana (UL FGG) – the Chair is in the building of the UL FGG Department of Environmental Civil Engineering at Hajdrihova 28 in Ljubljana – the main UL FGG building is at Jamova c. 2, Ljubljana. 2) UNESCO Chair also uses experimental river basins around Slovenia for applied hydrology research, established by the Chair of Hydrology and Hydraulic Engineering at UL FGG and plenty of field equipment, as well as hydraulic and geotechnical (soil mechanics) laboratory available at the UL FGG, and its computer facilities. 3) Furthermore, remote sensing equipment such as TLS or UAV from the UL FGG Department of Geodesy is also available for the UNESCO Chair.

Spaces at Institute of Cold Regions Science and Engineering in Northeast Forestry University, China: ICRSE has two parts, ICRSE research center(ICRSE-RC) has laboratories and conference rooms, a total of 400 m^2. Another is ICRSE field observation stations.

Spaces at Institute of Geography, National Autonomous University of Mexico:
Research Center and National Laboratory for Earth Observation

End of the Form