International Programme on Landslides—A Short Overview of Its Historical Development

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Abstract

The International Programme on Landslides (IPL) was launched in 2002 by the International Consortium on Landslides (ICL) to reduce landslide disaster risk, and in 2006 developed into a global cooperation programme by international organizations supporting ICL activities. Ever since, it is successfully managed by the Global Promotion Committee, consisting of the International Consortium on Landslides (ICL) members and representatives from the ICL supporting organizations. The article reviews the main IPL activities, i.e. IPL projects, triennial World Landslide Forums (WLF), World Centres of Excellence (WCoE) on Landslide Risk Reduction, and more. The article ends with an updated list of WCoEs 2008–2023 and IPL projects since 2002.

Keywords

International collaboration • International consortium on landslides • International programme on landslides • Landslide practice • Landslide research • Resilience • Sustainability

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1 International Programme on Landslides—IPL

The International Consortium on Landslides (ICL) was established in January 2002 as a non-profit scientific organization. The ICL was approved to be a NGO having operational relations with UNESCO in April 2007. The International Programme on Landslides (IPL) was launched at the first meeting of the Board of Representatives of ICL (BOR/ICL) at United Nations Educational, Scientific and Cultural Organization (UNESCO) Headquarters, Paris, in November 2002.

The International Programme on Landslides (IPL) as a global cooperation programme was further developed during a special thematic session of the United Nations World Conference on Disaster Reduction (WCDR) held in Kobe, Hyogo, Japan in January 2005, as a new international disaster science and capacity building initiative. The thematic session was organized by UNESCO, WMO, UNU, Ministry of Education, Culture, Sports, Science and Technology (MEXT) of the Government of Japan, and ICL.

The current second stage of IPL was defined and established by the 2006 Tokyo Action Plan "Strengthening Research and Learning on Landslides and Related Earth System Disasters for Global Risk Preparedness" (Sassa 2006). In 2006, the International Consortium on Landslides exchanged Memorandum of Understandings to promote IPL with each of ICL supporting organizations: United Nations Educational, Scientific and Cultural Organization (UNESCO), World Meteorological Organization (WMO), Food and Agriculture Organization of the United Nations (FAO), United Nations International Strategy for Disaster Risk Reduction (UNISDR), United Nations University (UNU), International Council for Science (ICSU), and the World Federation of Engineering Organizations (WFEO).

IPL as an international programme is managed by IPL Global Promotion Committee consisting of ICL and ICL supporting organizations (UNESCO, UNISDR and others).

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For more information on the International Consortium on Landslides (ICL), see a review paper in this volume, prepared by Sassa (2022c) or visit the new ICL web pages (ICL 2022).

In recent years, several review papers about the history, objectives and activities of IPL were published (e.g. Sassa 2004c; 2009a; Casagli et al. 2009; Sassa 2013; Mikoš and Mihalić Arbanas 2014; Han et al. 2017, 2020). This is an updated review paper on IPL history, objectives and its main activities: IPL projects, World Landslide Forums, World Centres of Excellence in Landslide Risk Reduction, and other IPL activities.

2 Global Promotion Committee (GPC)

2.1 Global Promotion Committee of the International Programme on Landslides (GPC/IPL)

Until the end of 2021, the International Programme on Landslides (IPL) was managed by the Global Promotion Committee (GPC), with ICL and ICL supporting organization selecting GPC/IPL Chair and several co-chairs. The first GPC Chair (2008–2013) was Salvano Briceño, former Director of UNISDR, and the second Chair (2014–2021) was Qunli Han, Director of Ecological and Earth Sciences, UNESCO.

The IPL World Centre (IWC) was established in 2006 by the Tokyo Action Plan to serve as the Secretariat of IPL and GPC/IPL. Members of the GPC/IPL were ICL Full Members and ICL Supporting Organizations (ICL 2018b).

2.2 Global Promotion Committee of the International Programme on Landslides and Kyoto Landslide Commitment 2020 (GPC/IPL-KLC)

ICL launched in 2020 a new voluntary commitment to the Sendai Framework for Disaster Risk Reduction 2015–2030, and to United Nations Agenda 2030 and its Sustainable Development Goals, namely the Kyoto Landslide Commitment 2020 (Sassa 2021a), a successor of the ISDR-ICL Sendai Partnerships for global promotion of understanding and reducing of landslide disaster risk 2015–2025 (Sassa 2015, 2016) (Fig. 1). For an overview of Sendai Voluntary Commitments, see the paper by Matsuoka and Gonzales Rocha (2020).

Through this development, GPC/IPL was transformed into the Global Promotion Committee of the International Programme on Landslides and Kyoto Landslide Commitment 2020 (GPC/IPL-KLC). Its Chair is selected from ICL and its Co-chairs from ICL supporting organizations. Since January 2022, the Chair of the GPC is Matjaž Mikoš, UNESCO Chair on Water-related Disaster Risk Reduction, University of Ljubljana, and Co-Chairs are Qunli Han, Executive Director of International Programme Office of Integrated Research on Disaster Risk (IRDR), Soichiro Yasukawa, Programme Specialist on Disaster Risk Reduction, UNESCO, Paris, Hiroshi Kitazato, Treasurer of IUGS, and John LaBrecque, Chair of IUGG GeoRisk Commission —Secretary to GPC is Kyoji Sassa, Director of IPL World Centre. Members of the newly established GPC/IPL-KLC are ICL Full Members, ICL Supporting Organizations, and KLC2020 Official Promoters.

3 IPL Projects

3.1 The Initial Stage of IPL Projects (2002–2008)

The initial stage of IPL projects which was managed by ICL, started in 2002 at the same time of ICL's foundation. The projects were divided into two categories: coordinating projects (called C-project) planned by several ICL members, and single member projects (called M-project) (Sassa et al. 2005). On overview of these initial IPL projects is given in Appendices Table 2. The first IPL project C-100 was publication of *Landslides: Journal of the International Consortium on Landslides*. This initial IPL project is still active, and the journal was a success from its launching and is nowadays effectively one of few leading journals in the field of landslide science and research (Mikoš et al. 2021).

Fig. 1 Logos of the ICL and Kyoto landslide commitment 2020

3.2 The IPL Projects (Since 2008)

Annually, all ICL members have the right to propose an IPL project using a structured application form (Sassa 2013). All submitted proposals are evaluated from formal point of view for their completeness by the ICL Secretariat in Kyoto, Japan, and then evaluated from their technical merit point of view by the IPL Evaluation Committee. In the last years, all proposals are evaluated on their objectives (35%), implementation capabilities (40%), and expected outputs (25%). All proposing institutions are asked to present their projects at annual ICL meetings, and they have a chance to improve their applications according to suggestions and comments received by the audience, and by written comments from the IPL Evaluation Committee. The project proposals are evaluated and ranked by at least ten landslide experts. Proposals with scores over the threshold of 70% are normally supported and approved by the Global Promotion Committee of IPL. All projects are declared on-going after their approval as long as they submit reports on an annual basis to the IPL Secretariat using structured report forms, and submit research articles on the project results to the journal *Landslides*, World Landslide Forums, or give presentations at annual IPL conferences. A full overview of all completed and on-going IPL projects is given in the Appendices Table 2.

Altogether 165 IPL projects (including subprojects) have been approved since 2002 in 36 countries, many have been completed or terminated after years of activities, and some are still on-going. On average, close to 10 projects are approved annually, running then for several years—at least for two years to be evaluated and approved. A short statistic with regard to IPL projects reveals the following (see Appendices Table 2 for details):

- the vast majority of projects are national projects, only a few are bilateral projects among two countries (Canada, China, Italy, Japan, Russian Federation, Sri Lanka, Vietnam)—the last such project is IPL-249 by Japan and Sri Lanka, approved in 2019.
- the highest number of IPL projects were approved in the following 12 countries: Italy (28), Japan (23), China (14), Russian Federation (11), Czech Republic (8), India (7), Indonesia (7), Malaysia (7), Sri Lanka (7), Canada (5), Malaysia (5), Slovenia (5), and the remaining 24 countries have 4 or fewer IPL projects.

3.3 The IPL Award for Success

The IPL Award for Success is selected by the IPL Award Committee and is given to a maximum three best successful projects implemented within IPL at the occasion of each World Landslide Forum following a rigorous evaluation of outputs, activities and impacts of all IPL projects during the previous 3-year cycle of activities. The achievements of awarded IPL projects are directly influenced by the finances and infrastructure of the developed or developing countries. The IPL Awards is not meant for best but rather the most successful IPL projects. The awarded IPL projects in the past are shown in italic fonts in Appendices Table 2. A list of all recipients is also published on the IPL web page: https://iplhq.org/category/iplhq/award-and-honors/ipl-award-for-success/.

4 World Landslide Forum (WLF)

The World Landslide Forums as triannual events were established by the 2006 Tokyo Action Plan as a special way of IPL promotional activities (ISDR-ICL 2008). Initially, WLF was proposed to be created as a global information platform for future joint activities of the world-wide landslide community. WLF should bring together academics, practitioners, politicians and other stakeholders to a global, multidisciplinary and problem-based platform. WLF was also seen as the place to recognize World Centres of Excellence (WCoE) in Landslide Risk Reduction and to support other ICL and IPL related promotional activities to global landslide community. Overview of World Landslide Forums since the first one WLF1 in Tokyo, Japan in 2008 (Fig. 3) with location, country, and forum motto is given in Table 1. All six logos of WLFs are given in Fig. 2.

World Landslide Forums can be evaluated as a case of good practice in the fields of landslide practice, research, science, and risk reduction. Normally, it attracts 500 + participants from all over the world, and the wealth of knowledge exchange among the participants was widely available to all stakeholders as published contributions in the WLF Proceedings. The outreach of these publications can be evaluated as solid if measured with bibliometric indices (Mikoš 2018). The last WLF5 in Kyoto, Japan published its reviewed contributions in the ICL Contribution to Landslide Disaster Risk Reduction book series in six volumes under the title "Understanding and Reducing Landslide Disaster Risk". This book series was now replaced by the book series "Progress in Landslide Research and Technology (P-LRT) to be published twice a year by Springer Nature (Sassa 2021b).

5 World Centre of Excellence (WCoE) in Landslide Risk Reduction

The World Centres of Excellence on Landslide Risk Reduction were established by the 2006 Tokyo Action Plan.

Table 1 World landslide forums since 2008

Year	Forum	Location, Country	Forum motto	References
2008	WLF 1	Tokyo, Japan	Strengthening research and learning on earth system risk analysis and sustainable disaster management within UN-ISDR as regards "landslides"	Sassa (2009a, b)
2011	WLF 2	Rome, Italy	Putting science into practice	Margottini et al. (2010); Sassa et al. (2012)
2014	WLF 3	Beijing, China	Landslide science for a safer geoenvironment	Sassa et al. (2015)
2017	WLF 4	Ljubljana, Slovenia	Advancing culture of living with landslides	Mikoš et al. (2017)
2020*	WLF 5	Kyoto, Japan	Implementing and monitoring the Sendai landslide partnerships 2015–2025	Sassa (2022a, 2022b)
2023	WLF 6	Florence, Italy	Landslide science for sustainable development	ICL (2022)

* Postponed to 2021 due to COVID pandemic

Fig. 2 Logos of six world landslide forums (2008–2023)

WCoE candidates are governmental and non-governmental entities such as universities, agencies, and other institutions, and their subsidiary entities (faculties, departments, centres, divisions or others) that are (i) contributing to risk reduction for landslides and related earth system disasters and (ii) are willing to support IPL intellectually, practically and financially by either joining ICL or contributing to GPC/IPL and promote landslide research and risk reduction on a regional and /or global scale in a mutually beneficial manner (Sassa 2013).

5.1 WCoE Guidelines and Evaluation Procedure

All WCoE candidates must submit their application form in a prescribed format to IPL Secretariat. Their applications are first evaluated by the IPL Evaluation Committee (10 + landslide experts from around the world) on the basis of their past achievements, current activities (e.g. scientific, technical and educational capacities, training courses, publications, dissemination of knowledge and information), and planned activities as WCoE to support IPL. Evaluation results are submitted to the Independent Panel of Experts nominated by the GPC/IPL. Their recommendations are finally approved by the GPC/IPL and identified at WLFs for the period of three years (Fig. 4). WCoEs must submit annual reports each year while active and may apply for a prolongation at the next WLF under the same rules as new candidates (Sassa 2013).

Since the first WLF1 in 2008 in Tokyo, triennially, out of all evaluated proposals, altogether 81 WCoEs from 23 countries and the European Commission (Joint Research Center in ISPRA Italy for 2011–2014) were recognized by the GPC/IPL.

5.2 WCoEs From 2008 till 2023

Triennially, out of all evaluated proposals, altogether 81 WCoEs from 23 countries and the European Commission

Fig. 3 Joint Photo of WLF1 participants at U-Thant hall of UNU in Tokyo on 18 November 2008 (Fig. 2 in Sassa 2009b)

Fig. 4 Twenty organizations were awarded the title of WCoE in landslide risk reduction at WLF4 in Ljubljana, 2017 (Fig. 1 from Mikoš et al. 2017)

(Joint Research Center in ISPRA Italy for 2011–2014) were announced at WLFs: twelve WCoEs at WLF1 in 2008, fifteen WCoEs at WLF2 in 2011 and WLF3 in 2014, twenty WCoEs at WLF4 in 2017, and nineteen WCoEs at WLF5 in 2021 (postponed by a year due to COVID-19 pandemic). An overview of all WCoEs is given in Appendices Table 3. The next selection of WCoEs will be completed for WLF6 in Florence, Italy in 2023.

Nearly all WCoEs were from (an) institution(s) of only one country, and the exceptions are WCoEs in Russian Federation & Kyrgyz Republic (2008–2011, 2011–2014, 2014–2017) and Japan & Sri Lanka (2020–2023). In each 3-year period, not more than two WCoEs were recognized in one country, such countries with two WCoEs in one term are: China (2014–2017, 2017–2020), India (2020–2023), Italy (2008–2011, 2020–2023), Japan (2011–2014, 2014–2017), Slovenia (2017–2020), and Sri Lanka (2017–2020).

The highest number of WCoEs for a 3-year period were recognized in the following countries: Italy (8), China (7), Slovenia (6), Czech Republic (5), Japan (5), India (4), Indonesia (4), Malaysia (4), Sri Lanka (4), and Thailand (4), Only two institutions were recognized as WCoE in all five periods: University of Florence, Italy (Casagli and Tofani 2019) and University of Ljubljana, Slovenia (Mikoš and Petkovšek 2019).

6 ICL-IPL Conference

ICL is holding its BOR annually, before COVID pandemic. This was associated with an annual conference called the IPL Symposium on Landslides (ICL 2018a). The proceedings of the recent conferences in years 2017, 2018, and 2019 are available in the pdf format on the web (Sassa and Dang 2017, 2018, 2019). The event is an occasion for ICL members to:

- report on their latest research results, including results of on-going IPL projects and from WCoEs activities as an additional research output to their published articles in the journal *Landslides*; and
- present their proposals for new IPL projects and new WCoEs as a part of the evaluation process.

The last IPL-KLC Hybrid Conference was in Kyoto, Japan, 14–16 March 2022. IPL was also organizing an International Forum entitled “Urbanization and Landslide Disaster” in Kyoto, Japan, dedicated to the Hiroshima Landslide Disaster of August, 2014 (Sassa et al. 2014).

Abbreviations

In this article, the following abbreviations were used:

BOR/ICL	Board of Representative Meeting of ICL.
DRR	Disaster Risk Reduction.
FAO	Food and Agriculture Organization of the United Nations.
GPC/IPL	Global Promotion Committee of the International Programme on Landslides.
GPC/IPL-KLC	Global Promotion Committee of the International Programme on Landslides and Kyoto Landslide Commitment.
IBRD	World Bank.
ICSU	International Council for Science.
ICL	International Consortium on Landslides.
IPL	International Program on Landslides.
IUGS	International Union of Geological Sciences.
JLS	Japan Landslide Society.
KLC2020	Kyoto Landslide Commitment 2020.
KU	Kyoto University.
SDG	Sustainable Development Goal of the 2030 United Nations Agenda.
SFDRR 2015-2030	Sendai Framework for Disaster Risk Reduction 2015–2030.
UNDP	United Nations Development Program.
UNEP	United Nations Environment Program.
UNESCO	United Nations Educational, Scientific and Cultural Organization.
UN-ISDR	United Nations International Strategy for Disaster Risk Reduction.
UNITWIN	University Twinning and Networking Scheme.
UNU	United Nations University.
WCDR	United Nations World Conference on Disaster Reduction.
WCoEs	World Centers of Excellence on Landslide Risk Reduction.
WFEO	World Federation of Engineering Organizations.
WMO	World Meteorological Organization.
WLF	World Landslide Forum.

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Appendices

See Tables 2 and 3.

Table 2 Chronological overview of the IPL projects since 2002 (Sassa et al. 2005; ICL 2012; Han et al. 2017, 2020; Bobrowsky and Sassa 2022; IPL web page archive at https://iplhq.org/)

IPL	Project title	Project leader	Country	Year
C100	Landslides: journal of the international consortium on landslides	Kyoji Sassa	Japan	2002
C101	Landslide risk evaluation and mitigation in cultural and natural heritage sites	Kyoji Sassa Paolo Canuti	Japan	2002
C101-1	Landslide investigation and capacity building in Machu Pichu-Aguas Calientes area	Kyoji Sassa	Japan	2002
C101-1-1	Low environmental impact technologies for slope monitoring by radar interferometry: application to Machu Picchu site	Claudio Margottini	Italy	2002
C101-1-2	Expressions of risky geomorphologic processes as well as paleogeographical evolution of the area of Machu Picchu	Vit Vilímek Jiři Zvelebil	Czech Republic	2002
C101-1-3	Shallow geophysics and terrain stability mapping techniques applied to the Urubamba Valley, Peru: landslide hazard evaluation	Romulo Mucho Peter Bobrowsky	Peru	2004
C101-1-4	A proposal for an integrated geophysical study of the Cuzco region	Daniel Nieto Yabar	Italy	2004
C101-1-5	UNESCO-Italian-ESA satellite monitoring of Machu Picchu	Paolo Canuti Claudio Margottini	Italy	2004
C101-2	Landslides monitoring and slope stability at selected historic sites in Slovakia	Jan Vlcko	Slovakia	2002

(continued)

Table 2 (continued)

IPL	Project title	Project leader	Country	Year
C101-3	*The geomorphological instability of the Buddha niches and surrounding cliff in Bamiyan valley (Central Afghanistan)*	*Claudio Margottini*	*Italy*	*2002*
C101-4	Stability assessment and prevention measurement of Lishan Landslide, Xian, China	Qing Jin Yang	China	2002
C101-5	Environment protection and disaster mitigation of rock avalanches landslides and debris flow in Tianchi Lake region and natural preservation area of Changbai Mountains, Northeast China	Binglan Cao	China	2002
C101-6	Conservation of Masouleh Town	S. H. Tabatabaei	Iran	2002
C101-7	Cultural and natural heritage threatened by landslides in the region of Iassy, Romania	Nicolae Botu	Romania	2005
C102 IPL-102	*Assessment of global high-risk landslide disaster hotspots*	*Farrokh Nadim*	*Norway*	*2002*
C103	Global landslide observation strategy	Kaoru Takara Nicola Casagli	Japan & Italy	2004
C104	World landslide database	Hiroshi Fukuoka Nicola Casagli	Japan & Italy	2006
C105	Early warning of landslides	Kyoji Sassa	Japan	2007
C106	Capacity building and outreach	Claudio Margottini Alexander Strom	Italy & Russian Federation	2008
C106-1	*Landslide museum in Civita di Bagnoregio*	*Claudio Margottini*	*Italy*	*2006*
C106-2	International summer school on rockslides and related phenomena in the Kokomeren river valley, Tien Shan, Kyrgyzstan	Alexander Strom	Russian Federation	2006
M101	Areal prediction of earthquake and rain induced rapid and long-travelling flow phenomena (APERITIF)	Kyoji Sassa Hiroshi Fukuoka	Japan	2002
M102	Disaster evaluation and mitigation of the giant Jinnosuke-dani Landslide in the Tedori water reservoir area, Japan	Tatsunori Matsumoto	Japan	2002
M103	Capacity building on management of risks caused by landslides in central American countries	Farrokh Nadim	Norway	2002
M104	A global literature study on the use of critical rainfall intensity for warning against landslide disasters	Haakon Heyerdal	Norway	2004
M105	Hurricane-flood-landslide continuum: a forecast system	Randall Updike	USA	2002
M106	*A best practices handbook for landslide hazard mitigation*	*Lynn Highland, Peter Bobrowsky*	*Canada*	*2002*
M107	Landslide risk assessment in landslide prone regions of Slovakia—modelling of climatic changes impact	Rudolf Holzer	Slovakia	2002
M108	Disaster evaluation and mitigation of landslides in the Three-Gorge water reservoir area, China	Renjie Ding	China	2002
M109	Recognition, mitigation and control of landslides of flow type in Greater Kingston and adjoining parishes in Eastern Jamaica, including public education on landslide hazard	Rafi Ahmad	Jamaica	2002
M110	Capacity building in landslide hazard management and control for mountainous developing countries in Asia	Hideaki Marui	Japan	2002
M111	Detail study of the internal structure of large rockslide dams in the Tien Shan and international field mission: Internal structure of dissected rockslide dams in Kyrgyzstan	Alexander Strom	Russian Federation	2002
M112/IPL-112	Landslide mapping and risk mitigation planning in Thailand	Saowanee Prachansri	Thailand	2002 2008
M113	Zone risk map: towards harmonized, intercomparable landslide risk assessment and risk maps	Yasser Elshayeb	Egypt	2002
M114	Landslide hazard assessment along Tehran-Caspian seaside corridors	Zieaoddin Shoaei	Iran	2002

(continued)

Table 2 (continued)

IPL	Project title	Project leader	Country	Year
M115	Establishment of a regional network for disaster mitigation, disaster education, and disaster database system in Asia	Ryuichi Yatabe	Japan	2003
M116	Standardization of terminology, integration of information and the development of decision support software in the area of landslide hazards	Catherine Hickson	Canada	2003
M117	Geomorphic Hazards from landslide dams	Oliver Korup	Switzerland	2003
M118	Development of an expert DSS for assessing landscape impact mitigation works for cultural heritage at risk	Giuseppe Delmonaco	Italy	2003
M119	Slope instability phenomena in Korinthos county	Nikos Nikolaou	Greece	2002
M120	Landslide hazard zonation in Garwal using GIS and geological attributes	Ashok Kumar Pachauri	India	2003
M121	Integrated system of a new generation for monitoring of dynamics of unstable rock slopes and rock fall early warning	Jiři Zvelebil Vit Vilímek	Czech Republik	2003
M122	Inka cultural heritage and landslides: detailed studies in Cusco and Sacred Valleys, Peru	Raul Carreno	Peru	2004
M123	Cusco regional landslide hazard mapping and preliminary assessment	Raul Carreno	Peru	2004
M124	The influence of clay mineralogy and ground water chemistry on the mechanism of landslides	Viktor Osipov	Russian Federation	2004
M125	Landslide mechanisms on volcanic soils	Carlos Eduardo Rodriguez	Colombia	2004
M126	Compilation of landslide/rockslide inventory of the Tien Shan mountain system	Alexander Strom	Russian Federation	2004
M127	Development of low-cost detector of slope instability for individual use	Ikuo Towhata	Japan	2004
M128	Development of sounding methodology for a root-reinforced landslide mass	Kazuo Konagai	Japan	2004
M129	Evaluation of natural hazards associated with rapid glacial retreat in Cordillera Blanca (Peru)	Vit Vilímek	Czech Republic	2005
M131	Technology development for landslide monitoring in China	Yueping Yin Peter Bobrowsky	China & Canada	2006
M132	*Research on vegetation protection system for highway soil slope in seasonal frozen regions*	*Wei Shan* *Fawu Wang*	*China, Japan*	*2006*
M133	Establishment of rainfall-soil chart for erosion induced landslide prediction	Roslan Abidin	Malaysia	2006
M134	Large-scale rockslides in coarse-bedded carbonate rocks in the Apennines (Italy), Caucasus (Russia) and Zagros (Iran): evaluation of possible triggers and hazard assessment	Alexander Strom	Russian Federation	2007
M135	Landslide hazard assessment in Changunarayan hill of Kathmandu, Nepal—geotechnical investigation and preventive plan	Ryuichi Yatabe	Japan	2008
M136	Shear behaviour and mechanics of Megaslides and their nearby faults in Hittian Balla, Pakistan and Shaolin, Taiwan	Kazuo Konagai Kyoji Sassa	Japan	2008
M137	Italian landslide inventory (IFFI Project)	Alessandro Triglia	Italy	2008
M138	Long run out and catastrophic landslides study: Yigong Landslide, Tibet China	Yin Yueping	China	2008
M139	Development of low-cost early warning system of slope instability for civilian use	Ikuo Towhata Taro Uchimura	Japan	2008
M140	Landslide and multi-geohazards mapping for community empowerment in Indonesia	Dwikorita Karnawati	Indonesia	2008
M141	Geo-risks management for third world countries—mapping and assessment of risky geo-factors for land use (e.g. in Ethiopia)	Jiří Zvelebil	Czech Republic	2008
IPL-142	Seismic landslide hazards mapping in Sichuan	Yuepin Yin	China	2009
IPL-143	Evaluation of sensitivity of the combined hydrological model (dynamic) for landslide susceptibility risk mapping in Sri Lanka	A. A. Virajh Dias	Sri Lanka	2008
IPL-144	*SafeLand—living with landslide risk in Europe: assessment, effects of global change, and risk management strategies*	*Bjørn Kalsnes*	*Norway*	*2009*

(continued)

Table 2 (continued)

IPL	Project title	Project leader	Country	Year
IPL-145	Preparation of landslide risk map in Taleghan Area-Iran	S. H. Tabatabaei	Iran	2009
IPL-146	Spatial monitoring of joint influence of an atmospheric precipitation and seismic motions on formation of landslides in Uzbekistan (Central Asia)	Rustam Niyazov	Uzbekistan	2009
IPL-147	Study on debris flow controlling factors and triggering mechanism in Peninsular Malaysia	Che Hassandi Abdullah	Malaysia	2009
IPL-148	Geo-evaluation of the stability of slopes around crater lakes in Cameroon: the cases of lakes Nyos, Barombi, Mbo and Awing	Ntasin Edwin Bongsiysi	Cameroon	2009
IPL-149	Canadian landslide best practice manual	Peter Bobrowsky	Canada	2009
IPL-150	*Capacity building and the impact of climate-driven changes on regional landslide distribution, frequency and scale of catastrophe*	*Ogbonnaya Igwe*	*Nigeria*	*2009*
IPL-151	Soil matrix suction in active landslides in flysch—the Slano Blato landslide case	Bojan Majes	Slovenia	2009
IPL-152	Assessment of coastal landslides risk by innovative remote sensing techniques	Gabriele Scarascia Mugnozza	Italy	2009
IPL-153	Landslide hazard zonation in Kharkov region of Ukraine using GIS	Oleksandr M Trofymchuk	Ukraine	2009
IPL-154	Development of a methodology for risk assessment of the earthquake-induced landslides	D. Higaki S. Tsuchiya	Japan	2009
IPL-155	*Determination of soil parameters of subsurface to be used in slope stability analysis in two different precipitation zones of Sri Lanka*	*A. A. Virajh Dias*	*Sri Lanka*	*2009*
IPL-156	Best practices for early warning of landslides in a changing climate scenarios	N. M. S. I. Arambepola	Thailand	2009
IPL-157	Dynamics of subaerial and submarine megaslides	Kyoji Sassa	Japan	2009
IPL-158	*Development of community-based landslide early warning system*	*Teuku Faisal Fathani*	*Indonesia*	*2009*
IPL-159	*Development of education program for sustainable development in landslide vulnerable area through student community service*	*Dwikorita Karnawati*	*Indonesia*	*2009*
IPL-160	Landslides and floods under extreme weather condition and resilient society	Hiroshi Fukuoka	Japan	2009
IPL-161	Risk identification and land-use planning for disaster mitigation of landslides and floods in Croatia	Hideaki Marui	Japan	2009
IPL-162	Tier-based harmonized approach for landslide susceptibility mapping over Europe	Javier Hervás	Italy	2009
IPL-163	Mechanical-mathematical modeling and monitoring for landslide processes	Svalova Valentina	Russian Federation	2009
IPL-165	Development of community-based landslide hazard mapping for landslide risk reduction at the village scale in Java, Indonesia	Dwikorita Karnawati	Indonesia	2010
IPL-167	*The effect of freezing–thawing on the stability of ancient landslide of North-Black highway*	*Wei Shan*	*China*	*2010*
IPL-168	Engaging U.S. citizens in landslide science through the website, "Did You See It? Report a Landslide"	Rex Baum	USA	2010
IPL-169	Landslide hazard and risk assessment in Geyser Valley (Kamchatka)	Oleg V. Zerkal	Russian Federation	2010
IPL-170	Landslide susceptibility and landslide hazard zonation in volcanic terrains using geographic information system (GIS): a case study in the Río Chiquitobarranca Del Muerto watershed; Pico de Orizaba volcano, México	Gabriel Legorreta Paulín	Mexico	2010
IPL-171	Study of the geotechnical characteristics of an unstable urban area of Barranquilla (Colombia) severely affected for slope instabilities and soil volume changes	Guillermo Ávila	Colombia	2010
IPL-172	Documentation, training and capacity building for landslides risk management	Surya Parkash	India	2011
IPL-173	Croatian virtual landslide data center	Snježana Mihalić Arbanas	Croatia	2011

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Table 2 (continued)

IPL	Project title	Project leader	Country	Year
IPL-175	Development of landslide risk assessment technology and education in Vietnam and other areas in the Greater Mekong sub-region	Kyoji Sassa Nguen Xuan Khang	Japan, Vietnam	2011
IPL-176	Slope data acquisition along highways in Sabah state for hazard assessment and mapping	Che Hassandi Abdullah	Malaysia	2012
IPL-177	Study on geological disasters focusing on landslides in and around Tegucigalpa City, Honduras	Anábal Godoy	Honduras	2012
IPL-179	Database of glacial lake outburst floods (GLOFs)	Adam Emmer Vit Vilímek	Czech Republic	2012
IPL-180	Introducing community-based early warning system for landslide hazard management in Cox's bazaar municipality, Bangladesh	N. M. S. I. Arambepola	Thailand	2011
IPL-181	Study of slow moving landslide Umka near Belgrade, Serbia	Biljana Abolmasov	Serbia	2012
IPL-182	Characterization of landslides mechanisms and impacts as a tool to fast risk analysis of landslides related disasters in Brazil	Renato Eugenio de Lima	Brazil	2012
IPL-183	*Landslides in West Africa: impacts, mechanism and management*	*Igwe Ogbonnaya*	*Nigeria*	*2012*
IPL-184	Study of landslides in flysch deposits of North Istria, Croatia: sliding mechanisms, geotechnical properties, landslide modeling and landslide susceptibility	Željko Arbanas	Croatia	2012
IPL-185	Landslide hazards assessment and modeling sediment yield of landslides using geographic information system (GIS): a case study in the Río El Estado on the SW flank of Pico de Orizaba volcano, Puebla-Veracruz, Mexico	Gabriel Legorreta Paulín	Mexico	2013
IPL-186	*Rock-fall hazard assessment and monitoring in the archaeological site of Petra, Jordan*	*Claudio Margottini*	*Italy*	*2013*
IPL-187	Design and validation of an early warning system for landslides—DeVEL	Rolf Katzenbach	Germany	2013
IPL-188	Study of slow-moving landslide Potoška planina (Karavanke Mountain, NW Slovenia)	Marko Komac	Slovenia	2013
IPL-190	Landslide risk identification and resilience study in tectonically active mountains and sea floors	Hiroshi Fukuoka	Japan	2013
IPL-191	Landslide hazard zonation in Carpathian region of Ukraine using GIS	Yakovliev Yevhenii Oleksandr M. Trofymchuk	Ukraine	2015
IPL-192	Development of post-earthquake rainfall induced landslide (PERIL) hazard mitigation framework	Binod Tiwari	USA	2015
IPL-193	Integrated systems for landslides monitoring, early warning and risk mitigation along motorways	Pasquale Versace	Italy	2015
IPL-194	Public awareness and education programme for landslides management in Malaysia	Che Hassandi Abdullah	Malaysia	2015
IPL-195	Study for mitigation and recovery of mud eruption disaster in East Java and modeling for risk reduction mudflow hazards	Paulus P. Rahardjo	Indonesia	2015
IPL-196	Development and applications of a multi-sensors drone for geohazards monitoring and mapping	Veronica Tofani	Italy	2015
IPL-197	Low frequency, high damaging potential landslide events in "low risk" regions—challenges for hazard and risk management	Jan Klimeš	Czech Republic	2015
IPL-198	Multi-scale rainfall triggering models for Early Warning of Landslides (MUSE)	Filippo Catani	Italy	2015
IPL-199	*The effect of root systems in natural slope erosion protection in the hill country of Sri Lanka*	*Pvip Perera*	*Sri Lanka*	*2015*
IPL-200	*An assessment of the rock fall susceptibility based on cut slopes adjacent to highways and railways*	*H. M. J. M. K. Herath*	*Sri Lanka*	*2015*
IPL-201	Landslide inventory and susceptibility map in durres and Kavaja region	Hasan Kuliçi	Albania	2016
IPL-202	Ripley landslide monitoring project (Ashcroft, BC, Canada)	Peter Bobrowsky	Canada	2016

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Table 2 (continued)

IPL	Project title	Project leader	Country	Year
IPL-203	Analysis and identify of landslides based on species distribution and surface temperature difference	Ying Guo	China	2016
IPL-204	A study on socio-economic and environmental impacts of landslides	Surya Prakash	India	2016
IPL-205	Integrated systems for landslides monitoring, early warning and risk mitigation along motorways	Pasquale Versace Giovanna Capparelli	Italy	2016
IPL-206	Towards improved landslide mapping and forecasting	Fausto Guzzetti Mario Parise	Italy	2016
IPL-207	Evaluation on social research approach in determining "acceptable risk" and "tolerable risk" in landslide risk areas in Malaysia	Che Hassandi Bin Abdullah	Malaysia	2016
IPL-208	*Landslide disaster risk communication in mountain areas*	*Irasema Alcántara-Ayala*	*Mexico*	*2016*
IPL-209	Landslides and related sediment disaster project covering the entire South–East Nigeria, West Africa	Igwe Ogbonnaya	Nigeria	2016
IPL-210	Massive landsliding in Serbia following Cyclone Tamara in May 2014	Biljana Abolmasov	Serbia	2016
IPL-211	Development of wireless sensor network for monitoring and earlier warning of shallow and deep landslides (WISE-LAND)	Adrin Tohari	Indonesia	2016
IPL-212	The construction of a global database of giant landslides on oceanic island volcanoes	Matt Rowberry	Czech Republic	2016
IPL-213	Real-time landslide monitoring and early warning system in western ghats & Himalayas, India	Maneesha Vinodini Ramesh	India	2016
IPL-215	The development of paleo-landslides in the middle part of the Moskva river valley within the limits of the Moscow City	Oleg Zerkal	Russian Federation	2016
IPL-216	Diversity and hydrogeology of mass movements in the Vipava valley, SW Slovenia	Timotej Verbovšek	Slovenia	2016
IPL-217	*PROTHEGO—PROTection of European cultural HEritage from GeO–hazards*	*Daniele Spizzichino Claudio Margottini*	*Italy*	*2017*
IPL-218	Landslide rapid mapping from remote sensing	Ping Lu	China	2017
IPL-219	Rockfall hazard identification and rockfall protection in the coastal zone of Croatia	Željko Arbanas	Croatia	2017
IPL-220	Kostanjek landslide monitoring project (Zagreb, Croatia)	Martin Krkač	Croatia	2017
IPL-221	PS continuous streaming for landslide monitoring and mapping	Federico Raspi Silvia Bianchini, Andrea Ciampalini	Italy	2017
IPL-222	Landslide risk analysis and mitigation in the ancient rock-cut city of Vardzia (Georgia)	Claudio Margottini	Italy	2017
IPL-223	Landslides in Africa: understanding catastrophic failures and effective preventive measures in vulnerable regions of the continent	Igwe Ogbonnaya	Nigeria	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	Alexander Strom	Russian Federation	2017
IPL-225	Recognition of potentially hazardous torrential fans using geomorphometric methods and simulating fan formation	Matjaž Mikoš	Slovenia	2017
IPL-226	Studying landslide movements from source areas to zone of deposition using a deterministic approach	Mateja Jemec Auflič	Slovenia	2017
IPL-227	Development of a web based landslide information system for the landslides in Sri Lanka	K. M. Weerasinghe	Sri Lanka	2017
IPL-228	BLISM (Bosnian landslide investigation and stabilization method)	Sabid Zekan	Bosnia and Herzegovina	2017
IPL-230	Evolution-based key technology of landslide prevention in Three Gorges Reservoir region, China	Huiming Tang	China	2018
IPL-231	Landslide mechanism considering soil–water–vegetation coupling effects	Su Lijun	China	2018

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Table 2 (continued)

IPL	Project title	Project leader	Country	Year
IPL-232	Investigations on landslides in Nilgiris, Tamil Nadu, India	S. S. Chandrasekaran	India	2018
IPL-233	Archival records and documentation of some socio-economically significant landslides in India	Surya Parkash	India	2018
IPL-234	Development of landslide detection system based on rainfall prediction and seismic aspect in Banjarnegara Region, Centre of Java, Indonesia	Munawar	Indonesia	2018
IPL-235	EO4GEO—towards an innovative strategy for skills development and capacity building in the space geo-information sector supporting Copernicus user uptake	Luca Guerrieri Daniele Spizzichino	Italy	2018
IPL-236	A multiparametric field laboratory for the investigation on the relationship between material behavior and morphodynamic of landslides	Andrea Segalini	Italy	2018
IPL-237	The role of time-dependent rock mass deformations and landscape evolution rates as predisposing factors for massive rock slope failures	Carlo Esposito	Italy	2018
IPL-238	Landslides threatening Russian cultural heritage sites	D. N. Gobotsov	Russian Federation	2018
IPL-239	Detailed interpretation and evaluation of dynamic model behavior of Pothupitiya landslide potential area (combined ground water and slope stability dynamic model under PC raster environment)	A A Virajh Dias	Sri Lanka	2018
IPL-240	Global lecture series—recent advances on landslide analysis and remediation	Binod Tiwari	USA	2018
IPL-242	Studies of disasters related to natural and anthropogenic landslides in Brazil—characterization of landslides triggers and impacts as a tool to rapid risk analysis	Renato Eugenio de Lima	Brazil	2019
IPL-243	Wildfire-related landslides in Italy: triggering mechanisms and propagation processes	Giuseppe Mandrone	Italy	2019
IPL-244	Evolution mechanism and control of landslides induced by sudden rainstorm	Huiming Tang	China	2019
IPL-245	Laboratory physical modeling of rainfall, slope deformation and landslides triggering	Giovanna Capparelli	Italy	2019
IPL-246	Classification and spatial distribution of landslides on dumps in brown coal basin in the Czech Republic	Martin Veselý	Czech Republic	2019
IPL-248	Innovation in slow-moving landslide risk assessment of roads and urban sites by combining multi-sensor multi-source monitoring data	Dario Peduto	Italy	2019
IPL-249	Development of early warning technology of rain-induced rapid and long-travelling landslides in Sri Lanka	Kazuo Konagai Asiri Karunawardena	Japan, Sri Lanka	2019
IPL-250	Investigation of ecohydrological processes on soil-root mechanical properties and landslide susceptibility in the steep terrain regions, Eastern Tibetan Plateau	Peng Cui	China	2020
IPL-251	Advancing landslide early warning systems using machine learning & artificial intelligence techniques	Maneesha Vinodini Ramesh	India	2020
IPL-252	Landslide monitoring with cost-effective GNSS devices and development of a new equipment (LZERO) for real-time applications	David Zuliani	Italy	2020
IPL-253	Integrated landslide disaster risk research in Mexico	Irasema Alcántara-Ayala	Mexico	2020
IPL-254	Ukraine cultural heritage objects within landslide hazardous sites	Oleksandr M. Trofymchuk	Ukraine	2020

The initial stage of the International Programme on Landslides (IPL: 2002–2008) was under support from UNESCO Coordinating projects (C by multiple members) and Member projects (M by a single member). IPL projects receiving IPL Award of Success are given in italic

Table 3 All recognized world centres of excellence for landslide risk reduction since 2008 in the chronological order (Han et al. 2017, 2020; Bobrowsky and Sassa 2022)

No	Title	Leader	Country	Organization
World centre of excellence 2008–2011				
1	Scientific research for mitigation, preparedness and risk assessment of landslides	Yuepin Yin	China	China geological survey
2	Landslide field research and capacity building through international collaboration	Vit Vlimek	Czech Republic	Faculty of science, Charles university in Prague
3	Earth observation advanced technologies for landslide monitoring, management and mitigation	Nicola Casagli	Italy	Department of earth science, University of Florence
4	Research and development of advanced technology for landslide hazard analysis	Alberto Presitininzi Gabriele Scarascia-Mugnozza	Italy	Research centre on prediction prevention and control of georisks of Rome University "La Sapienza"
5	Development of methodology for risk assessment of the earthquake-induced landslides	Hideaki Marui	Japan	The Japan Landslide Society (JLS)
6	Implementation of national slope master plan	Ashaari Mohamad Che Hassandi bin Abdullah	Malaysia	Slope engineering branch, public works department of Malaysia
7	Research on mitigation of landslide risk and training of specialists	Farrokh Nadim	Norway	International centre for Geohazards (ICG) at NGI
8	International summer school on rockslides and related phenomena in the Kokomeren river basin, Kyrgyzstan	Alexander Strom	Russian Federation & Kyrgyz Republic	Institute of geospheres dynamics of Russian academy of science (IDG RAS) & Kyrgyz institute of seismology (KIS)
9	Mechanisms of landslides in over-consolidated clays and flysch	Bojan Majes Matjaž Mikoš	Slovenia	University of Ljubljana, faculty of civil and geodetic engineering (UL FGG)
10	Landslide inventorization and susceptibility mapping in South Africa	S. Diop SG Chiliza	South Africa	Engineering geoscience unit, council for geoscience
11	Promoting knowledge sharing, innovations and institutions with south–south focus network on landslide risk reduction in Asia	N. S. M. I. Arambepola	Thailand	Asian disaster preparedness center
12	Conduct landslide hazard assessments and develop early warning systems	Peter Lyttle	USA	U.S. geological survey
World centre of excellence 2011–2014				
1	Canadian landslide loss risk reduction strategy and implementation	Peter T. Bobrowsky	Canada	Geological survey of Canada
2	Risk assessment and disaster mitigation code for long run-out landslides	Yueping Yin	China	China geological survey
3	Scientific research for landslide risk analysis and international education for mitigation and preparedness	Vit Vilimek	Czech Republic	Charles university, faculty of science
4	Research on landslide risk management harmonisation in support to European union policy making	Javier Hervás	European commission	Joint research centre, European commission
5	Training, research and documentation on landslides risk management	Surya Parkash	India	National institute of disaster management
6	Development of community-based and most adaptive technology for landslide risk reduction	Dwikorita Karnawati	Indonesia	Universitas Gadjah Mada
7	Advanced technologies for landslides	Nicola Casagli Filippo Catani	Italy	Department of earth science, university of Florence
8	Development of a methodology for risk reduction of earthquake-induced landslides	Daisuke Higaki	Japan	The Japan landslide society (JLS)
9	Risk identification and land-use planning for disaster mitigation of landslides	Hideaki Marui	Japan	Niigata university, institute for natural hazards and disaster recovery

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Table 3 (continued)

No	Title	Leader	Country	Organization
10	Landslide monitoring and community based early warning systems	Irasema Alcántara-Ayala	Mexico	National autonomous university of Mexico
11	Research on mitigation of landslide risk and training of specialists	Farrokh Nadim	Norway	International centre for geohazards at NGI
12	Annual Summer school on rockslides and related phenomena in Kyrgyzstan	Alexander Strom	Russian Federation & Kyrgyz Republic	Inst. of geospheres dynamics of Russian academy of sciences & Kyrgyz institute of seismology
13	Mechanisms of landslides in over-consolidated clays and flysch	Bojan Majes	Slovenia	University of Ljubljana, faculty of civil and geodetic engineering (UL FGG)
14	Promoting knowledge, innovations and institutions with south-south focus through a regional network of landslide risk reduction	N. S. M. I. Arambepola	Thailand	Asian disaster preparedness center
15	Scientific research for landslide hazard analysis, U. S. geological survey	Peter Lyttle	USA	U.S. geological survey landslide programme
World centre of excellence 2014–2017				
1	Formation mechanism research, disaster warning and universal education of cold regions landslide	Wei Shan	China	Research center of cold regions landslide
2	Scientific research for mitigation, preparedness and risk assessment of landslides	Wang Min	China	China geological survey
3	Scientific research for landslide risk analysis, modeling, mitigation and education	Liang-Jenq Leu	Chinese Taipeh	Department of civil engineering, national Taiwan university
4	Landslide risk reduction in the Adriatic-Balkan region through the regional cooperation	Željko Arbanas Snježana Mihalić Arbanas	Croatia	Croatian landslide group
5	Landslide risk assessment and development guidelines for effective risk reduction	Josef Stemberk	Czech Republic	Institute of rock structure and mechanics Czech academy of sciences & charles university, faculty of science
6	Development of community-based and most adaptive technology for landslide risk reduction	Dwikorita Karnawati	Indonesia	Universitas Gadjah Mada, Yogyakarta
7	Advanced technologies for landslides (ATLaS)	Nicola Casagli	Italy	Department of earth science, university of Florence
8	Emergency response support system for large-scale landslide disasters	Satoshi Tsuchiya	Japan	The Japan landslide society (JLS)
9	Risk identification and land-use planning for disaster mitigation of landslides	Hiroshi Fukuoka	Japan	Niigata university, institute for natural hazards and disaster recovery
10	Implementation of national slope master plan	Che Hassandi Abdullah	Malaysia	Slopes engineering branch, public works department of Malaysia
11	Building human capacities and expertise in landslide disaster risk managements	Ogbonnaya Igwe	Nigeria	Department of geology, university of Nigeria, Nsukka, Nigeria
12	International summer school on rockslides and related phenomena in the Kokomeren river valley, Tien Shan, Kyrgyzstan	Alexander Strom	Russian Federation & Kyrgyz Republic	Geodynamics research center—branch of JSC "Hydroproject institute" & institute of seismology of national academy of sciences of Kyrgyz Republic
13	Mechanisms of landslides and creep in over-consolidated clays and flysch	Ana Petkovšek	Slovenia	University of Ljubljana, faculty of civil and geodetic engineering (UL FGG)
14	Developing model policy frameworks, standards and guidelines	Nihal Rupasinghe A. A. Virajh Dias	Sri Lanka	Central engineering consultancy Bureau, Colombo
15	Promoting knowledge, innovations and institutions with south-south focus through a regional network of landslide risk reduction in changing climate scenario in Asia	N. M. S. I. Arambepola	Thailand	Asian disaster preparedness center (ADPC)

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Table 3 (continued)

No	Title	Leader	Country	Organization
World centre of excellence 2017–2020				
1	Landslide monitoring and critical infrastructure	Peter T. 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 Mihalić Arbanas, Željko 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 Florence
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, public works department of Malaysia
12	Landslides integrated research for disaster risk reduction	Irasema Alcántara Ayala	Mexico	National autonomous university of Mexico (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	Russian Federation	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 (UL FGG)
17	Landslide risk reduction in Slovenia	Mateja Jemec Auflič	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)

(continued)

Table 3 (continued)

No	Title	Leader	Country	Organization
World centre of excellence 2020–2023				
1	Slow moving translational landslides in argillaceous soils and weak rocks	Michael T. Hendry	Canada	University of Alberta
2	Formation mechanism research, disaster warning, and universal education of cold regions landslide	Wei Shan	China	Research center of cold regions landslide
3	Landslide modeling: from physical to phenomenological models	Željko Arbanas Snježana Mihaljić Arbanas	Croatia	Croatian landslide group
4	Community centered landslide disaster risk reduction in changing climate, continuation	Josef Stemberk	Czech Republic	Institute of rock structure and mechanics Czech academy of sciences & Charles university, faculty of science
5	Documentation, training and capacity enhancement on landslides risk reduction and resilience	Surya Parkash	India	National institute of disaster management (NIDM), Ministry of home affairs, government of India, New Delhi
6	Internet of things (IoT) for landslide disaster risk reduction	Maneesha V Ramesh	India	Amrita Vishwa Vidyapeetham, Amritapuri campus
7	Development of risk reduction strategy and technological innovation for landslide mitigation	Teuku Faisal Fathani	Indonesia	Universitas Gadjah Mada
8	Development of multidisciplinary and integrated methodologies for mitigating geological risks	Francesca Bozzano	Italy	CERI—Centro di Ricerca Previsione, Prevenzione e Controllo dei Rischi Geologici (Research centre on geological risks)—Sapienza Università di Roma
9	Advanced technologies for landslides (ATLaS)	Nicoa Casagli	Italy	UNESCO chair for the prevention and the sustainable management of geo-hydrological hazards, university of Florence
10	Integrated research on landslide disaster risk	Irasema Alcántara-Ayala	Mexico	Institute of geography, national autonomous university of Mexico (UNAM)
11	Landslides in weathered heterogeneous sedimentary rock masses such as Flysch	Matjaž Mikoš	Slovenia	University of Ljubljana, faculty of civil and geodetic engineering (UL FGG)
12	International training course on slope land disaster reduction	Louis Ge	Chinese Taipeh	Department of civil engineering, national Taiwan university
13	National Slope Master Plan, method of certification heritage objects in hazardous landslide sites	Oleksandr Trofymchuk	Ukraine	The institute of telecommunication and global information space (ITIGS) of the national academy of science of Ukraine (NASU), research institute of building constructions (RIBC)
14	Developing model policy frameworks, standards, and guidelines on landslide disaster reduction	S. S. I. Kodagoda	Sri Lanka	Central engineering consultancy Bureau
15	Research on landslide initiation mechanism based on physical model	Katsuo Sasahara & Asiri Karunawardena	Japan & Sri Lanka	The Japan landslide society & national building research organisation
16	Bridging science, policies, and partnership for landslide risk management	Hans Guttman	Thailand	Asian disaster preparedness center (ADPC)
17	Central Asia rockslide inventory. compilation, analysis and training	Alexander Strom	Russian Federation	JSC “Hydroproject institute”
18	Harmonization of landslides data and national authorities capacity building for landslide risk reduction—continuation	Biljana Abolmasov	Serbia	University of Belgrade, Faculty of Mining and Geology
19	Landslide susceptibility map assessment base on climatological changes using geographic information systems	Ir. Hj. Zulkifly Bin A. Ghani	Malaysia	Slope engineering branch, public work department Malaysia

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