

**Application Form for World Centre of Excellence on Landslide Risk Reduction**

**2020-2023**

1. Name of Organization :



**CENTRAL ENGINEERING CONSULTANCY BUREAU, Sri Lanka**  
– ICL/IPL – GPC Member, Since 2008

2. Name of Leader:

**Eng. (Ms.) S. S. I. Kodagoda**

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Core members of the activities :

Eng. (Ms.) K. M. Weerasinghe

Civil Engineer, Coordinator – Teaching tools;  
Geoinformatics and Numerical Model Studies

Ms. H. M. J. M. K. Herath

Engineering Geologist, Team Leader IPL -M200

Eng. (Ms.) L. K. N. S. Kulathilake

Earth Resources Engineer

3. Date of Submission of Application : 30<sup>th</sup> October 2019

4. Activity scale and targeted region.

1) Global, 2) Intercontinental, 3) Continental, 4) Regional, 5) National

5. Short Title :

**Developing Model Policy Frameworks, Standards, and Guidelines on Landslide  
Disaster Reduction**

## 6. Objectives for the initial 3 years:

- I. Conduct all the relevant project activities and act as the local cooperative organization in the International Collaborative Project: Development of Early Warning Technology of Rain-induced Rapid and Long Travelling Landslides in Sri Lanka under the SATREPS Project (Science and Technology Research Partnership for Sustainable Development)
- II. Develop a Collaborative Research Programme on Application of seismic aspects for local designs which can be incorporated in National Development Projects.
- III. Conduct the International E-conference 2021 (3<sup>rd</sup> E-conference) on Landslide Disaster Reduction and establish a Network of Intellectuals, Practitioners and Scientists to address the Global Issues caused by landslides and Reduction methods to be incorporated in local context.

## 7. Background Justification: (10 lines maximum)

CECB is a member of the ICL/IPL-GPC since 2008 and obtained the Membership of the ICL Capacity Development Network. CECB has also been admitted as a Member of the Board of Representatives of ICL in all matters dealing with landslide initiatives in year 2012. Further CECB has been entitled as a World Centre of Excellence since 2014.

## 8. Resources available for WCoE activities

### **Natural Resources Management & Laboratory Services of CECB**

The Centre for Research and Development unit of Natural Resources Management & Laboratory Services in CECB, is involved with conducting scientific research where all the attention is focused on the compelling needs of our client and the nation as a whole. Our multi disciplinary Engineering & Scientific approach evolves through a broad spectrum of research and development which consist of three main categories; Investigation, Design Implementation and Disaster Mitigation.

**Personnel** - In-house large professional staff including civil/geotechnical engineers, environmental scientists, planners, geologists, chemists, biologists, computer programmers including Independent Administration and Financial Unit.

**Other Facilities** - Large auditorium (about 120 nos); in-house mini lecture room facility; advanced soil laboratory facility; chemical and environmental laboratory facility; geotechnical investigation unit, field instrumentation and monitoring unit etc.

**Budgets** - Local funds available for local training, research and documentation

**Affiliation and Contribution to ICL/IPL-GPC**- Member of the ICL/IPL-GPC since 2008 and obtained the Membership of the ICL Capacity Development Network. CECB has also been admitted as a Member

of the Board of Representatives of ICL in all matters dealing with landslide initiatives in year 2012. Further CECB has been entitled as a World Centre of Excellence in 2014-2017 and 2017-2020.

## 9. Description of past activities related to risk reduction of landslides and other related earth system disasters

### 9.1 World Centre of Excellence – Developing Model Policy Frameworks, Standards, and Guidelines on Landslide Disaster Reduction (2014-2017, 2017-2020).

CECB has been entitled as a "World Centre of Excellence on Landslide Disaster Reduction 2014-2017 and 2017-2020".

### 9.2 International E-Conference on Landslide Risk Reduction - 2015 and 2017

- CECB has taken the initiative of organizing an International E-Conference with the primary objective of Developing an Applicable Master Plan for Landslide Risk Mitigation by identifying the critical factors that may directly affect it and developing a set of Teaching Tools/Guidelines which is more practical and suitable in the level of understanding by the actual victims. The conference was a fusion of scientists, researchers, intellectuals and practitioners from institutional or industrial organizations. In 2015, around 300 participants from 18 countries and 20 keynote experts/facilitators worldwide supported for an effective communication platform throughout the project. The conference was carried out through an official website (<http://e-conference.crdcecbsl.lk/>) specifically created as an open source media to enable all viewers to connect simultaneously to share their ideas and comments related to the topic. In 2017, the 2<sup>nd</sup> E-conference (<http://econference2017.crdcecbsl.lk/>) was also held focusing on the following topics :
- Youth Empowerment in Landslide Disaster Risk Reduction through Knowledge Sharing
- Disaster Resilient Housing, Building, Land Management and Agricultural Development
- Indigenous Knowledge in Landslide Disaster Management

9.2 Conducting Consultation Workshops- 2015, 2017 : A consultation workshop was conducted to identify the thematic areas to come up with feasible solutions for the issues faced by vulnerable communities from the grass root level. A Question Session was conducted which clarified all the issues related to landslide hazard utilizing the expertise knowledge to provide the best solution. The experts reviewed the globally available imperative information, identified research needs and gaps in existing recommendations directly relevant to the current issues in Landslide Risk Mitigation.

9.3 Landslide Research; 2002 to date: Recent tragic incidences of Landslides in Sri Lanka have led to a widespread loss of life and massive disruption in standard of living. It may be speculated that the

human encroachment into landslide prone areas and vast range of human undertakings in these surroundings have often steered to increase the risk. CECB has taken various initiative of implementing landslide research works which may immediately supports upon the development of investigation and design guidelines.

9.4 Operational Professional Combine 2013: Due to the devastating impact caused by landslides in Rathnapura District 2003, a task force was created for the implementation of landslide mitigation works to actively propose an Action Plan, to assess the extent of the impact and degree of hazard of each locality in the District. The Operational Professional Combine was formulated in this stage with the main objective being to provide a detailed inventory of existing instabilities of the respective study areas and identify the need of immediate evacuations of people from hazardous locations. The OPC investigated 316 localities and identified 139 high risk zones which need 754 immediate evacuations, 73 moderate risk zones where 497 families were warned and 101 low to very low risk zones where 44 families were made aware of the landslide risk who could move back to their original locality.

9.5 Adoption of the Hyogo Framework for action: Reducing the disaster risk is a cost effective investment in preventing future losses based on the adoption of the Hyogo Framework as discussed in the Sendai partnership (in March 2015). Keeping with global trend, an increase in disaster events was shown in Sri Lanka, despite better awareness and availability of expertise brought about by the Hyogo Framework for Action implementation processes. Similarly, increased incidences of landslides in Sri Lanka over the recent years impacted heavily on lives and investment creating overall setbacks in development and well-being of individuals and communities. This has ultimately contributed towards the development of the Teaching Tools in a more feasible manner.

#### 9.6 IPL Registered Projects

- IPL Certified Project M143 -2009; Evaluation of Sensitivity of the Combined Hydrological Model (Dynamic) for Landslide Susceptibility Risk Mapping in Sri Lanka – Completed 2012 ; Team Leader – Eng. A. A. Virajh Dias
- IPL Certified Project M155 -2012; Determination of Soil Parameters of Subsurface to be Used in Slope Stability Analysis in two Different Precipitations Zones of Sri Lanka; Eng. A. A Virajh Dias

- IPL Certified Project M 200 – 2015; An assessment of the rock fall susceptibility based on cut slopes adjacent to highways and railways; Team Leader – Ms. H.M.J.M.K. Herath – ongoing project
- IPL Certified Project -2017; Development of a Web Based Landslide Information System for the Landslides in Sri Lanka. Team Leader – Eng. (Ms.) K.M. Weerasinghe – ongoing project

#### 10. Planned future activities /Expected Results:

Planned future activities	Expected Results	Work phases
Conducting the 3 <sup>rd</sup> International E-conference in Year 2021- under the theme of Model policy Frameworks, Standards and Guidelines on Landslide Disaster Reduction	Create a cluster of intellectuals to disseminate knowledge and exchange experiences related to disaster resilience Open up a communication media to exchange future activities and action plans on disaster reduction.	April 2021 to June 2021
Conduct all the relevant project activities and act as the local cooperative organization in the International Collaborative Project: Development of Early Warning Technology of Rain-induced Rapid and Long Travelling Landslides in Sri Lanka under the SATREPS Project	Act as local cooperative organization and adopt the research techniques learnt through this project into local level disaster mitigation	January 2021 to the end of the project
Conduct an Assessment of the Rock fall Susceptibility Based on Cut Slopes Adjacent to Highways and Railways. Future Project Activities; Numerical evaluation of data, Laboratory and Field testing, data collection (Phase 2 activity) Development of advanced method of assessments, conducting in-situ testing, back analysis and modeling of case studies; verification and sensitivity assessment. Finalizing the design approaches	The proposed rating mechanism for geological factors of the RHRS is based on an evaluation of geological stability of overhanging rock slopes in 7 different pairwise categories summarized as a Combined Rating Criteria for Geological Evidences for Rockfall Hazard System above. This system is supported to give the narativeness of decision making in geological factors.	January 2020 to June 2021
Design novel strategies and mitigatory action plans to minimize the risk in landslide prone areas considering the discussed particulars in the conference.	Establishment of global communication network to acquire landslide risk management aspects and documented	July 2020 to September 2020

<p>Development of a web based landslide information system for the landslides in Sri Lanka</p> <p>Future Project Activities ;  (a)Continuing collection of landslide information, (b) Field data verification on past landslides, where possible, (c) Continuing designing of front end architecture using PHP, Java etc., (d) Development of tools for data analyses at the users' end.  Continuing collection of data, if new landslides occur.</p>	<p>a. Mysql database on landslide information available at CECB  b. Preliminary user interface for retrieving landslide information</p> <p>Publication:  “A Landslide Information System for Sri Lanka: A tool for Decision Making”, Kumari M. Weerasinghe , A.A.V. Dias , H.M.J.M.K. Herath , A.M.K.B. Atapattu, Proceedings of the CECB Symposium – 2018, Colombo, November 2018, PP 219-223,</p>	<p>January 2020 to August 2020</p>
<p>Conducting workshops and Capacity building</p>	<p>Organize capacity building events on Road Base-Landslide risk reduction and management at various levels to integrate Landslide risk management practices</p>	<p>February 2023</p>

#### 11. Beneficiaries of WCoE:

CECB jointly collaborate with local and state regulatory agencies in various national projects therefore the target group consists primarily of members of the respective institutions related to the disaster mitigation of Sri Lanka such as; Disaster Management Centre (DMC) and other government institutions, Project proponents of development projects, consultants, academics, researchers and the practitioners. The indirect beneficiaries are the communities living in the landslide risk prone areas and the civil society at large.

#### 12. References:

- 12.1 Dias,A A V, Goonasekara, U & Rupasinghe, N.,2001. *Natural Slope Instability Measures of Roads in Hill Country, Sri Lanka* , Proc. 8th World Emergency Management Conference, Oslo, Norway from 19- 21 June, 2001.TIEMS.
- 12.2 Dias,A A V, & Wijewardana, P R .,2002. *Community Base Participatory Model in Natural Disaster Preparedness - Landslides*, Proc. 9th World Emergency Management Conference, Toronto, Canada, 14-17 May, 2002. TIEMS
- 12.3 Dias,A A V & Dias, S V., 2002 *Key to Environmental Assessment Model in Landslides by Observational Method of Approach*, International Workshop on Environmental Geomechanics ; Ascona, Switzerland, June 30 to July 5, 2002.
- 12.4 Dias,A A V, & Dias, S V & Siva, G V M De .,2003. *Integrated Environmental Emergency Response Stage in Natural Disaster Preparedness – Landslides*, Proc. 10th World Emergency Management Conference, Nice, France from May, 2003. TIEMS
- 12.5 Dias, A A V; Rupasinghe, N; Gunathilake, A A J K; *Joint Technical Emergency Operation*

- Experiences on Landslide Disaster Mitigation Event 2003, Sri Lanka*. Proceedings of the Proceedings of the Second World Landslide Forum – 3-7 October 2011, Rome.
- 12.6 Dias, A A Virajh, Abayakoon S B S, and Bhandari, R K; *Discrete Boundary Shear Strength of a Landslide at High Rainfall Precipitation Zone in Sri Lanka*; World Landslide Forum 3; Beijing, China, 2014.
- 12.7 Mallawarachchi, M A S N, Ekanayake, E M T M, Kodagoda, S S I and Dias, A A Virajh ; *Comparison of soil modulus E50 of residual soil slope failures in two different rainfall zones*. World Landslide Forum 3; Beijing, China, 2014.
- 12.8 Herath, H M J M K, Kodagoda S S I and Dias, A A Virajh ; *Shallow Modes of Slope Failure in Road Earth Cuttings in Sri Lanka*; World Landslide Forum 3; Beijing, China, 2014.
- 12.9 A A Virajh Dias and A A J K Gunathilake; *Evaluation of Sensitivity of the WAA and SINMAP models for landslide susceptibility risk mapping in Sri Lanka*; World Landslide Forum 3; Beijing, China, 2014.
- 12.10 Rupasinghe, N, Dias, A A Virajh and Hennayake, Shantha K; *Role of Intervening Agencies and Officials in Emergency Risk Management of Landslides, Sri Lanka*; World Landslide Forum 3; Beijing, China, 2014.
- 12.11 Lakmali, M A D C, Herath, H M J M K, Kodagoda, S S I, Andree, S N L and Dias, A A Virajh ; *Database Designing for the Road Affected Landslides and Quantitative Evaluation of Landslide Risk*; World Landslide Forum 3; Beijing, China, 2014.
- 12.12 Ekanayake, T M, Herath, H M J M K, and Dias, A A Virajh ; *Strength Characteristics of Intact Metamorphic Rocks of Sri Lanka under Varying State of Stresses*; International Conference of Geotechnical Engineering(ICGE)10<sup>th</sup>– 11<sup>th</sup> August 2015 in Colombo
- 12.13 Dias, A.A.V., Katuwala, N.N., Herath, H.M.J.M.K., Perera P V I P., Sahabandu, K. L. S., Rupasinghe, N., *Model Policy Frameworks, Standards and Guidelines on Landslide Disaster Reduction (WCoE 2014–2017)*, Springer, May 2017.

13. If your organization is an ongoing WCoE 2017-2020, please attach the articles reporting activities of WCoE, IPL project and ICL network published/contributed to either in *Landslides: CECB* is an ongoing WCoE 2017-2020. It has also worked under the WCoE title in 2014-2017. Articles reporting the major WCoE activities such as the International E-conference, IPL Research Projects, and articles contributed to WLF5 are being attached with this application.

14. List of published or planned reports of WCOE 2017-2020 in journal “Landslides” or “WLF5 books” for ongoing WCOE organization.

The articles contributed to Fifth World Landslide Forum are being attached with this application.