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| Date of Submission | 03-April-2023 |
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IPL Project Proposal Form 2023

(MAXIMUM: 3 PAGES IN LENGTH)

1. Project Title: (2 lines maximum): Development of the Landslide Risk Reduction Strategies for protection and safety of Heritage Sites.

2. Main Project Fields

Select the suitable topics. If no suitable one, you may add new field.

(1) Technology Development

A. Monitoring and Early Warning, B. Hazard Mapping, Vulnerability and Risk Assessment

(2) Targeted Landslides: Events, Impacts, Actions / Inactions and Lessons Learnt

A. Catastrophic Landslides, B. Landslides Threatening Heritage Sites

(3) Capacity Building

A. Enhancing Human and Institutional Capacities

B. Collating and Disseminating Information/ Knowledge

(4) Mitigation, Preparedness and Recovery

A. Preparedness, B. Mitigation, C. Recovery

3. Name of Project Leader: Professor Surya Parkash, Ph.D.

Affiliation (office and position): Head, Geo-meteorological Risks Management Division, National Institute of Disaster Management, (Ministry of Home Affairs, Government of India), Plot no. 15, Pocket-3, Block-B, Sector-29, Rohini, Delhi -110042 Website: <https://nidm.gov.in>
Email: surya.nidm@nic.in, suryanidm@gmail.com

Likely Partners / Collaborators: Disaster Management Authorities at national, state & district levels

4. Objectives: (5 lines maximum; what you expect to accomplish?)

- To identify the risks associated with landslide at heritage sites
- To develop Landslide Risk Reduction strategies for protection and safety of heritage sites
- To enhance human and institutional capacity for Landslide Risk Reduction and Resilience

5. Background Justification (10 lines maximum):

Landslides in India are a common, wide spread, frequent and often sudden disasters in the hilly terrains, particularly adversely affecting the highways, human habitats, infrastructures, economy and environment. Due to the rapid pace of development, urbanization and changing climatic conditions, the trend in terms of both the occurrence of socio-economically significant landslides and their impacts seem to be rising. It has resulted in damage to buildings, roads, bridges and other infrastructures, as well as the loss of human lives, livestock and crop loss. Landslide also increase the risk of flooding and other natural disasters, which can pose a threat to public safety. Beside heavy precipitation the landslide has also occurred due to seismicity in the geo-dynamically active zones.

Keeping in mind the above background, the project has been proposed to identify the risk, develop strategies for protection and safety, enhance human and institutional capacity for landslide risk

reduction process of the prone areas.

6. Study Area (2 lines maximum; where will the project be conducted/applied?): The project will be implemented at heritage site of India prone to landslide.
7. Project Duration: (1-line maximum): 3 years
8. Resources necessary for the Project and their mobilization

Personnel:

- Shubham Badola, NIDM
- Ajit Batham, NIDM
- Gunda Goutham Krishna Teja, NIDM
- Hari Hara Kumar Devada, NIDM
- Aafreen Haider, NIDM
- Parveen Sulthana, NIDM

Budget:

9. Project Description (30 lines maximum): The project would require extensive study of the news articles, reports, websites, available publications, government memorandums, departmental investigations, social surveys and public interactions in the landslide affected areas. A systematically designed structured format for identifying risk, on landslide events, impacts, actions / inactions and lessons learnt would be developed for carrying out this study (The project would also consider the format suggested in World Report on Landslides but also examine the needs of disaster management authorities).

After collection and compilation of landslide sinking risk, analysis of the information will be done to summarize the outcomes of the study in a comprehensive manner to find out the trends and distributions of landslide events and their impacts as well as enhancing understanding about landslides, for disseminating the same to the concerned stakeholders for enhancing their human capacities for landslides risk reduction and resilience. Technical guidance and support from the expert members of ICL would be sought to make the study effective, practical and usable by the various stakeholders. Finally, a publication would be brought out for wider sharing of this work in humanitarian interest at global level.

10. Work Plan/Expected Results (20 lines maximum; work phases and milestones):

1 Year – Literature survey and studies including correspondence with concerned departments, news agencies, respective ministry and organizations / institutes etc.

6 months – Analysis of the available data and information as per requirements of the proposed study

1 Year – Documentation / Development of strategies for Landslide Risk Reduction and Resilience at heritage sites

6 months – Report writing and publication for dissemination of the acquired knowledge

11. Deliverables/Time Frame (10 lines maximum; what and when will you produce?):

Identifying the cause & risk associated with landslide – 1 year after the approval of project

Data Analysis and Documentation of Some Selected Socio-economically Significant Landslides –2

years 6 months after the approval of project

Publication of Final Report – 3rd year / Final year of the project

12. Project Beneficiaries (5 lines maximum; who directly benefits from the work?):

The beneficiaries from the outcome of the project would include disaster management authorities at different levels (local, district, state and national), archeologist, concerned line departments and organizations, educational, research and training institutes working on landslides, affected communities, professionals engaged in developmental activities in such landslide affected areas.

13. References (Optional) (6 lines maximum; i.e. relevant publications)

- Parkash, S. (2023). Lessons Learned from Landslides of Socio-economic and Environmental Significance in India. In *Progress in Landslide Research and Technology*, Volume 1 Issue 2, 2022 (pp. 309-315). Cham: Springer International Publishing.
- Parkash Surya, Jindal Dipali, Bindal Manoj, Kathait, Anil and Roy, TKS (2023). *Archival Records of Socio-economically Significant Landslides in India*; Published by National Institute of Disaster Management, Delhi, India
- Kaur, H., Sarkar, R., Gupta, S., Parkash Surya, Thapa, R., & Meena, S. R. (2022). The Vulnerability of Human Population to Landslide Disaster: A Case Study of Sikkim Himalayas. *Impact of Climate Change, Land Use and Land Cover, and Socio-economic Dynamics on Landslides*, 319-333.
- Saraswat, R., Parkash Surya, & Pal, S. (2020). Landslide Susceptibility Assessment Due to Construction of Buildings in Garhwal Area Using GIS. In *Smart Cities—Opportunities and Challenges: Select Proceedings of ICSC 2019* (pp. 871-885). Springer Singapore.
- Kaur, H., Gupta, S., Parkash Surya, & Thapa, R. (2019). Past is the key to the future: Landslide Inventory. *JANGIS: Vol-6*, 17.
- Badola, S., Mishra, V. N., & Parkash, S. (2023, January). Landslide susceptibility mapping using XGBoost machine learning method. In *2023 International Conference on Machine Intelligence for GeoAnalytics and Remote Sensing (MIGARS)* (Vol. 1, pp. 1-4). IEEE.
- Parkash Surya: "Capacity Development for Landslides Risk Reduction in India-A National Initiative for Loss Reduction", Chapter-26, V-6, Part-V: Risk Management and Capacity Development, Book: *Landslides - Global Risk Preparedness* by Kyoji Sassa, B. Rouhban and S. Briceno (Eds.), Springer-Verlag Berlin Heidelberg, 2012, pp.369- 384, 978-3-642-22086-9 (Print) 978-3-642-22087-6 (Online)
- Parkash Surya: "Awareness and Preparedness Strategies for Community based Disaster Risk Management with particular reference to Landslides", *Landslide Science and Practice* (Editors: Claudio Margotinni, Paolo Canuti and Kyoji Sassa), Springer Verlag Berlin Heidelberg, 2013; Volume 7: Social and Economic Impact and Policies, Part IV: Landslide Education, Training and Capacity Development, pp.265-270, ISBN: 978-3-64-31312-7, ISBN:978-3-642-31313-4 (eBook)
- Parkash Surya: "Tools, Techniques and Technologies for Capacity Enhancement to Reduce Landslide Risks and Promote Community Resilience", *Proceedings of International Conference on Landslides and Slope Stability (SLOPE 2015) Advancement of Research, Practice and Integrated*

Solutions on Landslides, held at Bali, Indonesia during 27-30 September 2015, pp.3-1 to 3-8, ISBN 978-602-71964-5-2, published by Parahyangan Catholic University, Bandung, Indonesia

- Parkash Surya: "PDF-tool-4.091-1.3: Community based Landslide Risk Reduction (24 pages)", ICL Landslide Teaching Tools (Editors: Kyoji Sassa, Bin He, Mauri McSaveney and Osamu Nagai), published by ICL, IPL and UNESCO, pp.376, ISBN: 978-4-9903382-2-0
- Parkash Surya: "PDF-tool-4.091-1.1: Guidelines for Landslides Management in India (190 pages)", ICL Landslide Teaching Tools (Editors: Kyoji Sassa, Bin He, Mauri McSaveney and Osamu Nagai), published by ICL, IPL and UNESCO, pp.374, ISBN: 978-4-9903382-2-0
- Parkash Surya: "PDF-tool-4.091-1.2: Training Module on Comprehensive Landslide Risk Management (304 pages)", ICL Landslide Teaching Tools (Editors: Kyoji Sassa, Bin He, Mauri McSaveney and Osamu Nagai), published by ICL, IPL and UNESCO, pp.375, ISBN: 978-4-9903382-2-0