

REFERENCES

- Abdalla J. A., Attom M. F., Hawileh R. (2015). Prediction of minimum factor of safety against slope failure in clayey soils using artificial neural network. *Environmental Earth Sciences*. 73: 5463-5477. doi:<https://doi.org/10.1007/s12665-014-3800-x>
- Agatonovic-Kustrin S., Beresford R. (2000). Basic concepts of artificial neural network (ANN) modeling and its application in pharmaceutical research. *Journal of pharmaceutical and biomedical analysis*. 22: 717-727
- Aleotti P., Chowdhury R. (1999). Landslide hazard assessment: summary review and new perspectives. *Bulletin of Engineering Geology and the environment*. 58: 21-44
- Alonso E. E. (1976). Risk analysis of slopes and its application to slopes in Canadian sensitive clays. *Geotechnique*. 26: 453-472
- Anbalagan R., Kohli A., Chakraborty D. (2008). Geotechnical evaluation of Harmony landslide on Karnaprayag–Gwaldam Road, Uttarakhand Himalaya. *Current science*. 1613-1619. doi:<https://www.jstor.org/stable/24100899>
- Babu G. S., Mukesh M. (2003). Risk analysis of landslides–A case study. *Geotechnical & Geological Engineering*. 21: 113-127
- Bartarya S. (1993). Hydrochemistry and rock weathering in a sub-tropical Lesser Himalayan river basin in Kumaun, India. *Journal of Hydrology*. 146: 149-174
- Bartarya S., Valdiya K. (1989). Landslides and erosion in the catchment of the Gaula River, Kumaun Lesser Himalaya, India. *Mountain Research and Development*. 9: 405-419. doi:<https://doi.org/10.2307/3673588>
- Basahel H., Mitri H. (2019). Probabilistic assessment of rock slopes stability using the response surface approach—a case study. *International Journal of Mining Science and Technology*. 29: 357-370
- Bhambri R., Mehta M., Singh S., Jayangondaperumal R., Gupta A. K., Srivastava P. (2017). Landslide inventory and damage assessment in the Bhagirathi Valley, Uttarakhand, during June 2013 flood. *Himalayan Geology*. 38: 193-224
- Bhandari R. The Indian landslide scenario, strategic issues and action points. In: India disaster management congress, New Delhi, 2006. Citeseer, pp 29-30
- Bharati A. K., Ray A., Khandelwal M., Rai R., Jaiswal A. (2021). Stability evaluation of dump slope using artificial neural network and multiple regression. *Engineering with Computers*. 1-9. doi:<https://doi.org/10.1007/s00366-021-01358-y>
- Bharti J. P., Mishra P., Sathishkumar V., Cho Y., Samui P. (2021). Slope Stability Analysis Using Rf, Gbm, Cart, Bt and Xgboost. *Geotechnical and Geological Engineering*. 1-12. doi:<https://doi.org/10.1007/s10706-021-01721-2>
- Bhasin R., Grimstad E., Larsen J. O., Dhawan A. K., Singh R., Verma S., Venkatachalam K. (2002). Landslide hazards and mitigation measures at Gangtok, Sikkim Himalaya. *Engineering Geology*. 64: 351-368. doi:[https://doi.org/10.1016/S0013-7952\(01\)00096-5](https://doi.org/10.1016/S0013-7952(01)00096-5)
- Bhattacharyya R. et al. (2015). Soil degradation in India: Challenges and potential solutions. *Sustainability*. 7: 3528-3570
- Bieniawski Z. (1973). Engineering classification of jointed rock masses. *Civil Engineering= Siviele Ingenieurswese*. 1973: 335-343
- Bieniawski Z. T. (1989). Engineering rock mass classifications: a complete manual for engineers and geologists in mining, civil, and petroleum engineering. John Wiley & Sons,
- Bishop C. M. (1995). Neural networks for pattern recognition. Oxford university press,
- Blight G. Slopes and excavations in residual soils. In: Proceedings of the 7, h International Conference on Soil Mechanics and Foundation Engineering, 1977. pp 582-590

- Brencich A., Cassini G., Pera D., Riotto G. (2013). Calibration and reliability of the rebound (Schmidt) hammer test. *Civil Engineering and Architecture*. 1: 66-78
- Calcaterra D., Parise M. (2005). Landslide types and their relationships with weathering in a Calabrian basin, southern Italy. *Bulletin of Engineering Geology and the Environment*. 64: 193-207
- Chakraborty A., Goswami D. (2017). Prediction of slope stability using multiple linear regression (MLR) and artificial neural network (ANN). *Arabian Journal of Geosciences*. 10: 385. doi:<https://doi.org/10.1007/s12517-017-3167-x>
- Chakraborty T., Mishra S., Loukus J., Halonen B., Bekkala B. (2016). Characterization of three Himalayan rocks using a split Hopkinson pressure bar. *International Journal of Rock Mechanics and Mining Sciences*. 112-118. doi:<https://doi.org/10.1016/j.ijrmms.2016.03.005>
- Chakravarti I. M., Laha R. G., Roy J. (1967). Handbook of methods of applied statistics. *Wiley Series in Probability and Mathematical Statistics (USA) eng*.
- Chang M., Liu Y., Zhou C., Che H. (2020). Hazard assessment of a catastrophic mine waste debris flow of Hou Gully, Shimian, China. *Engineering Geology*. 275: 105733
- Chansarkar R. Geological and geomorphic factors in landslides investigations. In: Proc. Seminar on landslides and toe erosion problems with special reference to Himalayan region, Gangtok, 1975. pp 54-66
- Chatterjee D., Krishna A. M. (2019). Effect of slope angle on the stability of a slope under rainfall infiltration. *Indian Geotechnical Journal*. 49: 708-717. doi:<https://doi.org/10.1007/s40098-019-00362-w>
- Chaturvedi O., Kaushal R., Tomar J., Prandiyal A., Panwar P. (2014) Agroforestry for wasteland rehabilitation: mined, ravine, and degraded watershed areas. In: Agroforestry Systems in India: Livelihood Security & Ecosystem Services. Springer, pp 233-271
- Chaudhary S., Gupta V., Sundriyal Y. (2010). Surface and sub-surface characterization of Byung landslide in Mandakini valley, Garhwal Himalaya. *Himalayan Geology*. 31: 125-132
- Che V. B., Fontijn K., Ernst G. G., Kervyn M., Elburg M., Van Ranst E., Suh C. E. (2012). Evaluating the degree of weathering in landslide-prone soils in the humid tropics: the case of Limbe, SW Cameroon. *Geoderma*. 170: 378-389
- Chen W., Sun Z., Han J. (2019). Landslide susceptibility modeling using integrated ensemble weights of evidence with logistic regression and random forest models. *Applied Sciences*. 9: 171. doi:<https://doi.org/10.3390/app9010171>
- Chen Z. Recent developments in slope stability analysis. In: 8th ISRM Congress, 1995. OnePetro,
- Cheung A. K., Yiu J., Lam H. W., Sze E. H. (2018). Advanced numerical analysis of landslide debris mobility and barrier interaction. *HKIE Transactions*. 25: 76-89
- Cho S. E. (2009). Probabilistic stability analyses of slopes using the ANN-based response surface. *Computers and Geotechnics*. 36: 787-797
- Choi S.-K., Park J.-Y., Lee D.-H., Lee S.-R., Kim Y.-T., Kwon T.-H. (2020). Assessment of barrier location effect on debris flow based on smoothed particle hydrodynamics (SPH) simulation on 3D terrains. *Landslides*. 1-18. doi:<https://doi.org/10.1007/s10346-020-01477-5>
- Choobasti A., Farrokhzad F., Barari A. (2009). Prediction of slope stability using artificial neural network (case study: Noabad, Mazandaran, Iran). *Arabian journal of geosciences*. 2: 311-319. doi:<https://doi.org/10.1007/s12517-009-0035-3>
- Chowdhury R., Tang W., Sidi I. (1987). Reliability model of progressive slope failure. *Geotechnique*. 37: 467-481
- Christian J. T. Reliability methods for stability of existing slopes. In: Uncertainty in the geologic environment: From theory to practice, 1996. ASCE, pp 409-418
- Christian J. T., Ladd C. C., Baecher G. B. (1994). Reliability applied to slope stability analysis. *Journal of Geotechnical Engineering*. 120: 2180-2207

- Clerici A., Perego S., Tellini C., Vescovi P. (2002). A procedure for landslide susceptibility zonation by the conditional analysis method. *Geomorphology*. 48: 349-364
- Cruden D. (2018). *Landslide risk assessment*. Routledge,
- D'Andrea R. A., Sangrey D. A. (1982). Safety factors for probabilistic slope design. *Journal of the Geotechnical Engineering Division*. 108: 1101-1118
- Das S. K., Basudhar P. K. (2006). Undrained lateral load capacity of piles in clay using artificial neural network. *Computers and Geotechnics*. 33: 454-459. doi:<https://doi.org/10.1016/j.compgeo.2006.08.006>
- Das S. K., Biswal R. K., Sivakugan N., Das B. (2011). Classification of slopes and prediction of factor of safety using differential evolution neural networks. *Environmental Earth Sciences*. 64: 201-210. doi:<https://doi.org/10.1007/s12665-010-0839-1>
- Das U., Saikia B. Shear strength of unsaturated residual soils of the Hills in Guwahati. In: Proceedings of Indian geotechnical conference, GEOTrendz, 2010. pp 679-682
- Dawson E., Roth W., Drescher A. (1999). Slope stability analysis by strength reduction. *Geotechnique*. 49: 835-840. doi:<https://doi.org/10.1680/geot.1999.49.6.835>
- Dershowitz W., Einstein H. (1988). Characterizing rock joint geometry with joint system models. *Rock mechanics and rock engineering*. 21: 21-51. doi:<https://doi.org/10.1007/BF01019674>
- Deshpande P., Patil J., Nainwal D., Kulkarni M. Landslide hazard zonation mapping in Gopeshwar, Pipalkoti and Nandprayag areas of Uttarakhand. In: Indian Geotechnical Conference, 2009. pp 16-19
- Dhiman R. K., Thakur M. (2022). Graphical charts for onsite Continuous Slope Mass Rating (CoSMR) classification using strike parallelism and joint dip or plunge of intersection. *Engineering Geology*. 298: 106559. doi:<https://doi.org/10.1016/j.enggeo.2022.106559>
- Ding X., Zhang L., Zhu H., Zhang Q. (2014). Effect of model scale and particle size distribution on PFC3D simulation results. *Rock mechanics and rock engineering*. 47: 2139-2156
- Duncan J. M. (1996). State of the art: limit equilibrium and finite-element analysis of slopes. *Journal of Geotechnical engineering*. 122: 577-596
- El-Ramly H., Morgenstern N., Cruden D. (2002). Probabilistic slope stability analysis for practice. *Canadian Geotechnical Journal*. 39: 665-683. doi:<https://doi.org/10.1139/t02-034>
- El-Ramly H., Morgenstern N., Cruden D. (2005a). Probabilistic assessment of stability of a cut slope in residual soil. *Geotechnique*. 55: 77-84. doi:<https://doi.org/10.1680/geot.2005.55.1.77>
- El-Ramly H., Morgenstern N., Cruden D. (2005b). Probabilistic assessment of stability of a cut slope in residual soil. *Geotechnique*. 55: 77-84. doi:<https://doi.org/10.1680/geot.2005.55.1.77>
- Ercanoglu M., Gokceoglu C. (2004). Use of fuzzy relations to produce landslide susceptibility map of a landslide prone area (West Black Sea Region, Turkey). *Engineering Geology*. 75: 229-250
- Ersöz T., Topal T. (2018). Assessment of rock slope stability with the effects of weathering and excavation by comparing deterministic methods and slope stability probability classification (SSPC). *Environmental Earth Sciences*. 77: 547. doi:<https://doi.org/10.1007/s12665-018-7728-4>
- Erzin Y., Cetin T. (2013). The prediction of the critical factor of safety of homogeneous finite slopes using neural networks and multiple regressions. *Computers & geosciences*. 51: 305-313. doi:<https://doi.org/10.1016/j.cageo.2012.09.003>
- Falae P. O., Agarwal E., Pain A., Dash R. K., Kanungo D. P. (2021). A data driven efficient framework for the probabilistic slope stability analysis of Pakhi landslide, Garhwal Himalaya. *Journal of Earth System Science*. 130: 1-15
- Fan S., Ma Y., Qin N. (2017). Basic characteristics and starting mode of debris flow in Tieshanzhang Mining Area under typhoon. *Geology, Ecology, and Landscapes*. 1: 241-248
- Fell R. (2018). *Landslide risk assessment*.
- Ferentinou M., Sakellariou M. (2007). Computational intelligence tools for the prediction of slope performance. *Computers and Geotechnics*. 34: 362-384

- Froehlich W., Starkel L. (1993). The effects of deforestation on slope and channel evolution in the tectonically active Darjeeling Himalaya. *Earth Surface Processes and Landforms*. 18: 285-290
- Gamble J. C. (1971). Durability-plasticity classification of shales and other argillaceous rocks. University of Illinois at Urbana-Champaign,
- Gao J., Sang Y. (2017). Identification and estimation of landslide-debris flow disaster risk in primary and middle school campuses in a mountainous area of Southwest China. *International journal of disaster risk reduction*. 25: 60-71
- Garson D. G. (1991). Interpreting neural network connection weights.
- Gerrard J. (1994) The landslide hazard in the Himalayas: geological control and human action. In: *Geomorphology and Natural Hazards*. Elsevier, pp 221-230. doi:<https://doi.org/10.1016/B978-0-444-82012-9.50019-0>
- Ghiasi M., Askarnejad N., Dindarloo S. R., Shamsoddini H. (2016). Prediction of blast boulders in open pit mines via multiple regression and artificial neural networks. *International journal of mining science and technology*. 26: 183-186
- Ghimire M. (2011). Landslide occurrence and its relation with terrain factors in the Siwalik Hills, Nepal: case study of susceptibility assessment in three basins. *Natural Hazards*. 56: 299-320
- Gomez H., Kavzoglu T. (2005). Assessment of shallow landslide susceptibility using artificial neural networks in Jabonosa River Basin, Venezuela. *Engineering Geology*. 78: 11-27. doi:<https://doi.org/10.1016/j.enggeo.2004.10.004>
- Gorsevski P. V., Gessler P. E., Jankowski P. (2003). Integrating a fuzzy k-means classification and a Bayesian approach for spatial prediction of landslide hazard. *Journal of geographical systems*. 5: 223-251
- Goswami R. K., Singh B. (2008). An Analysis of Causes of Urban Landslides in Residual Lateritic Soil.
- Gover S., Hammah R. (2013). A comparison of finite elements (SSR) and limit-equilibrium slope stability analysis by case study: Geotechnical engineering. *Civil Engineering= Siviele Ingenieurswese*. 2013: 31-34. doi:<https://hdl.handle.net/10520/EJC136239>
- Griffiths D., Lane P. (1999). Slope stability analysis by finite elements. *Geotechnique*. 49: 387-403. doi:<https://doi.org/10.1680/geot.1999.49.3.387>
- Gupta R., Saha A., Arora M., Kumar A. (1999). Landslide hazard zonation in a part of the Bhagirathi Valley. *Garhwal Mimalyas, using integrated remote sensing-GIS, Himalayan Geology*. 20: 71-85
- Gupta V., Bhasin R. K., Kaynia A. M., Kumar V., Saini A., Tandon R., Pabst T. (2016a). Finite element analysis of failed slope by shear strength reduction technique: a case study for Surabhi Resort Landslide, Mussoorie township, Garhwal Himalaya. *Geomatics, Natural Hazards and Risk*. 7: 1677-1690. doi:<https://doi.org/10.1080/19475705.2015.1102778>
- Gupta V., Bhasin R. K., Kaynia A. M., Tandon R. S., Venkateshwarlu B. (2016b). Landslide hazard in the Nainital township, Kumaun Himalaya, India: the case of September 2014 Balia Nala landslide. *Natural Hazards*. 80: 863-877. doi:<https://doi.org/10.1007/s11069-015-2002-5>
- Guthrie R. H., Evans S. G., Catane S. G., Zarco M. A., Saturay R. M. (2009). The 17 February 2006 rock slide-debris avalanche at Guinsaigon Philippines: a synthesis. *Bulletin of engineering geology and the environment*. 68: 201-213. doi:<https://doi.org/10.1007/s10064-009-0205-2>
- Guzzetti F., Carrara A., Cardinali M., Reichenbach P. (1999). Landslide hazard evaluation: a review of current techniques and their application in a multi-scale study, Central Italy. *Geomorphology*. 31: 181-216
- Guzzetti F., Malamud B. D., Turcotte D. L., Reichenbach P. (2002). Power-law correlations of landslide areas in central Italy. *Earth and Planetary Science Letters*. 195: 169-183
- Haigh M. J., Rawat J., Rawat M., Bartarya S., Rai S. (1995). Interactions between forest and landslide activity along new highways in the Kumaun Himalaya. *Forest Ecology and Management*. 78: 173-189. doi:[https://doi.org/10.1016/0378-1127\(95\)03584-5](https://doi.org/10.1016/0378-1127(95)03584-5)

- Hammah R., Yacoub T., Corkum B., Curran J. The shear strength reduction method for the generalized Hoek-Brown criterion. In: Alaska Rocks 2005, The 40th US Symposium on Rock Mechanics (USRMS), 2005. OnePetro,
- Hammah R., Yacoub T., Curran J. Probabilistic slope analysis with the finite element method. In: 43rd US Rock Mechanics Symposium & 4th US-Canada Rock Mechanics Symposium, 2009. OnePetro,
- Hammah R. E., Curran J. H., Yacoub T., Corkum B. Stability analysis of rock slopes using the finite element method. In: Proceedings of the ISRM regional symposium EUROCK, 2004.
- Hasegawa S., Dahal R. K., Yamanaka M., Bhandary N. P., Yatabe R., Inagaki H. (2009). Causes of large-scale landslides in the Lesser Himalaya of central Nepal. *Environmental Geology*. 57: 1423-1434. doi:<https://doi.org/10.1007/s00254-008-1420-z>
- Hassan A. M., Wolff T. F. (2000) Effect of deterministic and probabilistic models on slope reliability index. In: Slope Stability 2000. pp 194-208
- Haugen E., Kaynia A. (2008) Vulnerability of structures impacted by debris flow. In: Landslides and Engineered Slopes. From the Past to the Future, Two Volumes+ CD-ROM. CRC Press, pp 403-410
- Huat B. B., Ali F. H., Rajoo R. (2006). Stability analysis and stability chart for unsaturated residual soil slope. *American Journal of Environmental Sciences*. 2: 154-160. doi:<https://doi.org/10.3844/ajessp.2006.154.160>
- Huayong N., Wanmo Z., Zhi S., Wei X. (2014). Study on combined effect of natural debris flow and mine debris flow and prevention countermeasures. *工程地质学报*. 22: 928-935
- Hungr O., Leroueil S., Picarelli L. (2014). The Varnes classification of landslide types, an update. *Landslides*. 11: 167-194. doi:<https://doi.org/10.1007/s10346-013-0436-y>
- Hungr O., Yau H., Tse C., Cheng L., Cheng L. (1999) Natural slope hazard and risk assessment framework. In: Urban ground engineering. Thomas Telford Publishing, pp 332-353. doi:<https://doi.org/10.1680/uge.27862.0027>
- letto F., Perri F., Cella F. (2016). Geotechnical and landslide aspects in weathered granitoid rock masses (Serre Massif, southern Calabria, Italy). *Catena*. 145: 301-315
- Israil M., Pachauri A. (2003). Geophysical characterization of a landslide site in the Himalayan foothill region. *Journal of Asian Earth Sciences*. 22: 253-263. doi:[https://doi.org/10.1016/S1367-9120\(03\)00063-4](https://doi.org/10.1016/S1367-9120(03)00063-4)
- Iverson R. M. (1997). The physics of debris flows. *Reviews of geophysics*. 35: 245-296. doi:<https://doi.org/10.1029/97RG00426>
- Iverson R. M. (2014). Debris flows: behaviour and hazard assessment. *Geology today*. 30: 15-20. doi:<https://doi.org/10.1111/gto.12037>
- Jain A., Banerjee D., Kale V. S. (2020) Tectonics of the Himalaya. In: Tectonics of the Indian Subcontinent. Springer, pp 295-448
- Jaiswal P., Van Westen C., Jetten V. (2010). Quantitative assessment of direct and indirect landslide risk along transportation lines in southern India. *Natural hazards and earth system sciences*. 10: 1253-1267
- Jeong S. W. (2015). Geotechnical and rheological characteristics of waste rock deposits influencing potential debris flow occurrence at the abandoned Imgi Mine, Korea. *Environmental Earth Sciences*. 73: 8299-8310
- Jiang M., Jiang T., Crosta G. B., Shi Z., Chen H., Zhang N. (2015). Modeling failure of jointed rock slope with two main joint sets using a novel DEM bond contact model. *Engineering Geology*. 193: 79-96. doi:<https://doi.org/10.1016/j.enggeo.2015.04.013>
- Johari A., Lari A. M. (2017). System probabilistic model of rock slope stability considering correlated failure modes. *Computers and Geotechnics*. 81: 26-38. doi:<https://doi.org/10.1016/j.compgeo.2016.07.010>

- Joshi V., Naithani A., Negi G. (2001). Study of landslides in Mandakini river valley, Garhwal-Himalaya, India. *GAI/A*. 16: 87-95
- Kainthola A., Singh P., Verma D., Singh R., Sarkar K., Singh T. (2015). Prediction of strength parameters of himalayan rocks: a statistical and ANFIS approach. *Geotechnical and Geological Engineering*. 33: 1255-1278. doi:<https://doi.org/10.1007/s10706-015-9899-z>
- Kainthola A., Verma D., Singh T. (2013). Probabilistic and sensitivity investigation for the hill slopes in Uttarakhand, lesser Himalaya, India. *Am J Numer Anal*. 1: 8-14. doi:<https://doi.org/10.12691/ajna-1-1-2>
- Kalantar B., Pradhan B., Naghibi S. A., Motevallı A., Mansor S. (2018). Assessment of the effects of training data selection on the landslide susceptibility mapping: a comparison between support vector machine (SVM), logistic regression (LR) and artificial neural networks (ANN). *Geomatics, Natural Hazards and Risk*. 9: 49-69. doi:<https://doi.org/10.1080/19475705.2017.1407368>
- India tops the world in landslide deaths (2018) Deccan Herald. <https://www.deccanherald.com/national/india-tops-world-landslide-689244.html>. Accessed July 30 2019
- Kanungo D., Arora M., Sarkar S., Gupta R. (2009). Landslide Susceptibility Zonation (LSZ) Mapping—A Review. *Journal of South Asia Disaster Studies*. 2:
- Kanungo D., Pain A., Sharma S. (2013). Finite element modeling approach to assess the stability of debris and rock slopes: a case study from the Indian Himalayas. *Natural hazards*. 69: 1-24. doi:<https://doi.org/10.1007/s11069-013-0680-4>
- Karan P. P. (1989). Environment and development in Sikkim Himalaya: a review. *Human Ecology*. 17: 257-271
- Kaunda R. B., Chase R. B., Kehew A. E., Kaugars K., Selegean J. P. (2010). Neural network modeling applications in active slope stability problems. *Environmental Earth Sciences*. 60: 1545-1558
- Khandelwal M., Rai R., Shrivastva B. (2015a). Evaluation of dump slope stability of a coal mine using artificial neural network. *Geomechanics and Geophysics for Geo-Energy and Geo-Resources*. 1: 69-77. doi:<https://doi.org/10.1007/s40948-015-0009-8>
- Khandelwal M., Rai R., Shrivastva B. (2015b). Evaluation of dump slope stability of a coal mine using artificial neural network. *Geomechanics and Geophysics for Geo-energy and Geo-resources*. 1: 69-77. doi:<https://doi.org/10.1007/s40948-015-0009-8>
- Khandelwal M., Singh T. (2007). Evaluation of blast-induced ground vibration predictors. *Soil Dynamics and Earthquake Engineering*. 27: 116-125
- Kim J.-C., Lee S., Jung H.-S., Lee S. (2018). Landslide susceptibility mapping using random forest and boosted tree models in Pyeong-Chang, Korea. *Geocarto international*. 33: 1000-1015. doi:<https://doi.org/10.1080/10106049.2017.1323964>
- Kjekstad O., Highland L. (2009) Economic and social impacts of landslides. In: Landslides—disaster risk reduction. Springer, pp 573-587
- Koo Y. (1982). The mass strength of jointed residual soils. *Canadian Geotechnical Journal*. 19: 225-231. doi:<https://doi.org/10.1139/t82-029>
- Kruggel-Emden H., Simsek E., Rickelt S., Wirtz S., Scherer V. (2007). Review and extension of normal force models for the discrete element method. *Powder Technology*. 171: 157-173. doi:<https://doi.org/10.1016/j.powtec.2006.10.004>
- Kumar D., Mishra A. K., Kundu V., Gairola B. (2003). Slope stability assessment of Tambakhani Chute, part of Varunavat landslide, Uttarakashi, Uttarakhand, India. *Jour Engg Geol (ISEG)*.
- Kumar M., Rana S., Pant P. D., Patel R. C. (2017). Slope stability analysis of Balia Nala landslide, Kumaun Lesser Himalaya, Nainital, Uttarakhand, India. *Journal of Rock Mechanics and Geotechnical Engineering*. 9: 150-158. doi:<https://doi.org/10.1016/j.jrmge.2016.05.009>

- Kumar R., Anbalagan R. (2016). Landslide susceptibility mapping using analytical hierarchy process (AHP) in Tehri reservoir rim region, Uttarakhand. *Journal of the Geological Society of India*. 87: 271-286. doi:<https://doi.org/10.1007/s12594-016-0395-8>
- Kumar V., Gupta V., Jamir I. (2018). Hazard evaluation of progressive Pawari landslide zone, Satluj valley, Himachal Pradesh, India. *Natural Hazards*. 1-19. doi:<https://doi.org/10.1007/s11069-018-3339-3>
- Lambe T. W. (1951). Soil testing for engineers vol 72. vol 5. LWW,
- Lari S., Frattini P., Crosta G. (2014). A probabilistic approach for landslide hazard analysis. *Engineering Geology*. 182: 3-14. doi:<https://doi.org/10.1016/j.enggeo.2014.07.015>
- Latha G. M., Garaga A. (2010). Seismic stability analysis of a Himalayan rock slope. *Rock Mechanics and Rock Engineering*. 43: 831-843. doi:<https://doi.org/10.1007/s00603-010-0088-3>
- Li Y., Ma C., Wang Y. (2019). Landslides and debris flows caused by an extreme rainstorm on 21 July 2012 in mountains near Beijing, China. *Bulletin of Engineering Geology and the Environment*. 78: 1265-1280. doi:<https://doi.org/10.1007/s10064-017-1187-0>
- Lim T., Rahardjo H., Chang M., Fredlund D. G. (1996). Effect of rainfall on matric suctions in a residual soil slope. *Canadian Geotechnical Journal*. 33: 618-628. doi:<https://doi.org/10.1139/t96-087>
- Lin H., Cao P. (2014). A dimensionless parameter determining slip surfaces in homogeneous slopes. *KSCCE Journal of Civil Engineering*. 18: 470-474
- Little A. The Engineering Classification of Residual Tropical Soils. In: Soil Mech & Fdn Eng Conf Proc/Mexico/, 1969.
- Lu P., Rosenbaum M. (2003). Artificial neural networks and grey systems for the prediction of slope stability. *Natural Hazards*. 30: 383-398. doi:<https://doi.org/10.1023/B:NHAZ.0000007168.00673.27>
- Mahanta B., Singh H., Singh P., Kainthola A., Singh T. (2016). Stability analysis of potential failure zones along NH-305, India. *Natural Hazards*. 83: 1341-1357. doi:<https://doi.org/10.1007/s11069-016-2396-8>
- Mamo G., Dey A. Critical overview of the effect of strain rate on direct shear test results. In: North East students geo-congress on advances in geotechnical engineering, 2014. Citeseer, pp 1-6
- Marrapu B. M., Jakka R. S. (2014). Landslide hazard zonation methods: A critical Review. *Int J Civ Eng Res*. 5: 215-220
- Martha T. R., Roy P., Govindharaj K. B., Kumar K. V., Diwakar P., Dadhwal V. (2015). Landslides triggered by the June 2013 extreme rainfall event in parts of Uttarakhand state, India. *Landslides*. 12: 135-146. doi:<https://doi.org/10.1007/s10346-014-0540-7>
- Mathew J., Jha V., Rawat G. (2007). Weights of evidence modelling for landslide hazard zonation mapping in part of Bhagirathi valley, Uttarakhand. *Current Science*. 628-638
- Matsuo M., Kuroda K. (1974). Probabilistic approach to design of embankments. *Soils and Foundations*. 14: 1-17
- McClelland J. L., Rumelhart D. E., Group P. R. (1986). Parallel distributed processing vol 2. MIT press Cambridge, MA,
- McGuire W., Burton P., Kilburn C., Willetts O. (2004). World Atlas of natural hazards. Arnold,
- McKenzie N. R., Hughes N. C., Myrow P. M., Xiao S., Sharma M. (2011). Correlation of Precambrian–Cambrian sedimentary successions across northern India and the utility of isotopic signatures of Himalayan lithotectonic zones. *Earth and Planetary Science Letters*. 312: 471-483. doi:<https://doi.org/10.1016/j.epsl.2011.10.027>
- Mehrotra G., Sarkar S., Kanungo D., Mahadevaiah K. (1996). Terrain analysis and spatial assessment of landslide hazards in parts of Sikkim Himalaya. *JOURNAL-GEOLOGICAL SOCIETY OF INDIA*. 47: 491-498

- Miščević P., Vlastelica G. (2014). Impact of weathering on slope stability in soft rock mass. *Journal of Rock Mechanics and Geotechnical Engineering*. 6: 240-250. doi:<https://doi.org/10.1016/j.jrmge.2014.03.006>
- Mishra S., Chakraborty T., Matsagar V., Basu D. (2018) Experimental characterization of Himalayan limestone. In: *Rock Dynamics—Experiments, Theories and Applications*. CRC Press, pp 65-71
- Monjezi M., Hasanipanah M., Khandelwal M. (2013). Evaluation and prediction of blast-induced ground vibration at Shur River Dam, Iran, by artificial neural network. *Neural Computing and Applications*. 22: 1637-1643
- Mukherjee A., Mitra A. (2001). Geotechnical study of mass movements along the Kalimpong approach road in the Eastern Himalayas. *Indian Journal of Geology*. 73: 271-280
- Nagarajan R., Khire M. (1998). Debris slides of Varandh Ghat, west coast of India. *Bulletin of Engineering Geology and the Environment*. 57: 59-63. doi:<https://doi.org/10.1007/s100640050021>
- Nandargi S., Dhar O. (2011). Extreme rainfall events over the Himalayas between 1871 and 2007. *Hydrological Sciences Journal*. 56: 930-945
- Nawani P. C., Naik S. R., Nair R. (2015) Massive Varunavat Hill Landslide Overlooking Uttarkashi Town in Uttarakhand Himalaya: Its Treatment Vis-a-Vis Stability Analysis. In: *Mountain Hazards and Disaster Risk Reduction*. Springer, pp 13-31. doi:https://doi.org/10.1007/978-4-431-55242-0_2
- Noorany I. (1984). Phase relations in marine soils. *Journal of Geotechnical Engineering*. 110: 539-543. doi:[https://doi.org/10.1061/\(ASCE\)0733-9410\(1984\)110:4\(539\)](https://doi.org/10.1061/(ASCE)0733-9410(1984)110:4(539))
- Oh H.-J., Lee S. (2017). Shallow landslide susceptibility modeling using the data mining models artificial neural network and boosted tree. *Applied Sciences*. 7: 1000. doi:<https://doi.org/10.3390/app7101000>
- Ollier C. (2010). Very deep weathering and related landslides. *Geological Society, London, Engineering Geology Special Publications*. 23: 5-14
- Pain A., Kanungo D., Sarkar S. (2014). Rock slope stability assessment using finite element based modelling—examples from the Indian Himalayas. *Geomechanics and Geoengineering*. 9: 215-230. doi:<https://doi.org/10.1080/17486025.2014.883465>
- Pal S., Kaynia A. M., Bhasin R. K., Paul D. (2012). Earthquake stability analysis of rock slopes: a case study. *Rock Mechanics and Rock Engineering*. 45: 205-215. doi:<https://doi.org/10.1007/s00603-011-0145-6>
- Pande R. K., Uniyal A. (2007). The fury of nature in Uttaranchal: Uttarkashi landslide of the year 2003. *Disaster Prevention and Management: An International Journal*. 16: 562-575. doi:<https://doi.org/10.1108/09653560710817048>
- Pandit K., Sarkar K., Samanta M., Sharma M. Stability analysis and design of slope reinforcement techniques for a Himalayan landslide. In: *Proceedings of the International Conference on Recent Advances in Rock Engineering, Bengaluru, 2016*. doi:<https://doi.org/10.2991/rare-16.2016.16>
- Panikkar S. V., Subramanyan V. (1997). Landslide hazard analysis of the area around Dehra Dun and Mussoorie, Uttar Pradesh. *Current Science*. 1117-1123
- Park H.-J., West T. R., Woo I. (2005). Probabilistic analysis of rock slope stability and random properties of discontinuity parameters, Interstate Highway 40, Western North Carolina, USA. *Engineering Geology*. 79: 230-250. doi:<https://doi.org/10.1016/j.enggeo.2005.02.001>
- Parkash S. (2011). Historical records of socio-economically significant landslides in India. *J South Asia Disaster Stud*. 4: 177-204
- Pastor J. L., Riquelme A. J., Tomás R., Cano M. (2019). Clarification of the slope mass rating parameters assisted by SMRTool, an open-source software. *Bulletin of Engineering Geology and the Environment*. 78: 6131-6142

- Pathak S., Nilsen B. (2004). Probabilistic rock slope stability analysis for Himalayan conditions. *Bulletin of Engineering Geology and the Environment*. 63: 25-32. doi:<https://doi.org/10.1007/s10064-003-0226-1>
- Pathak S., Poudel R. K., Kansakar B. R. (2006). Application of Probabilistic Approach in Rock Slope Stability Analysis—Experience from Nepal. *Disaster Mitig Debris Flows Slope Fail Landslides des*. 2: 797-802
- Paudel U., Oguchi T., Hayakawa Y. (2016). Multi-resolution landslide susceptibility analysis using a DEM and random forest. *International Journal of Geosciences*. 7: 726. doi:<https://10.4236/ijg.2016.75056>
- Paul S., Mahajan A. (1999). Malpa rockfall disaster, Kali valley, Kumaun Himalaya. *Current science*. 76: 485-487
- Petley D. (2012). Global patterns of loss of life from landslides. *Geology*. 40: 927-930
- Pham B. T., Prakash I., Bui D. T. (2018). Spatial prediction of landslides using a hybrid machine learning approach based on random subspace and classification and regression trees. *Geomorphology*. 303: 256-270. doi:<https://doi.org/10.1016/j.geomorph.2017.12.008>
- Phien-Wej N., Nutalaya P., Aung Z., Zhibin T. (1993). Catastrophic landslides and debris flows in Thailand. *Bulletin of the International Association of Engineering Geology-Bulletin de l'Association Internationale de Géologie de l'Ingénieur*. 48: 93-100. doi:<https://doi.org/10.1007/BF02594981>
- Picarelli L., Oboni F., Evans S., Mostyn G., Fell R. (2005) Hazard characterization and quantification. In: *Landslide risk management*. CRC Press, pp 37-72
- Poisel R., Preh A. Modifications of PFC3D for rock mass fall modeling. In: *Proceedings, 1st International FLAC/DEM Symposium, Minneapolis, 2008*. pp 1-4
- Pradhan B., Lee S. (2010a). Delineation of landslide hazard areas on Penang Island, Malaysia, by using frequency ratio, logistic regression, and artificial neural network models. *Environmental Earth Sciences*. 60: 1037-1054. doi:<https://doi.org/10.1007/s12665-009-0245-8>
- Pradhan B., Lee S. (2010b). Landslide susceptibility assessment and factor effect analysis: backpropagation artificial neural networks and their comparison with frequency ratio and bivariate logistic regression modelling. *Environmental Modelling & Software*. 25: 747-759. doi:<https://doi.org/10.1016/j.envsoft.2009.10.016>
- Prochaska A. B., Santi P. M., Higgins J. D., Cannon S. H. (2008). A study of methods to estimate debris flow velocity. *Landslides*. 5: 431-444
- Qi C., Tang X. (2018). Slope stability prediction using integrated metaheuristic and machine learning approaches: A comparative study. *Computers & Industrial Engineering*. 118: 112-122. doi:<https://doi.org/10.1016/j.cie.2018.02.028>
- Qian Z., Li A., Chen W., Lyamin A., Jiang J. (2019). An artificial neural network approach to inhomogeneous soil slope stability predictions based on limit analysis methods. *Soils and Foundations*. doi:<https://doi.org/10.1016/j.sandf.2018.10.008>
- Quraishi M. Z., Mouazen A. M. (2013). Development of a methodology for in situ assessment of topsoil dry bulk density. *Soil and Tillage Research*. 126: 229-237
- Rahardjo H., Aung K., Leong E. C., Rezaur R. (2004). Characteristics of residual soils in Singapore as formed by weathering. *Engineering Geology*. 73: 157-169. doi:<https://doi.org/10.1016/j.enggeo.2004.01.002>
- Raizada A., Juyal G. (2012). Tree species diversity, species regeneration and biological productivity of seeded *Acacia catechu* Willd. in rehabilitated limestone mines in the North West Indian Himalayas. *Land Degradation & Development*. 23: 167-174
- Rawat A. S. (1995). Deforestation and forest policy in the lesser Himalayan Kumaun: impacts on peasant women and tribal populations. *Mountain Research and Development*. 311-322
- Ray A., Bharati A. K., Rai R., Singh T. (2021). Landslide occurrences in Himalayan residual soil: a review. *HIMALAYAN GEOLOGY*. 42: 189-204

- Ray A., Kumar R. C., Bharati A. K., Rai R., Singh T. (2019a). Hazard Chart for Identification of Potential Landslide Due To the Presence of Residual Soil in the Himalayas. *Indian Geotechnical Journal*. 50: 604-619. doi:<https://doi.org/10.1007/s40098-019-00401-6>
- Ray A., Kumar R. C., Bharati A. K., Rai R., Singh T. (2019b). Hazard Chart for Identification of Potential Landslide Due To the Presence of Residual Soil in the Himalayas. *Indian Geotechnical Journal*. 1-16. doi:<https://doi.org/10.1007/s40098-019-00401-6>
- Ray A., Kumar R. C., Rai R., Gupta S. (2020a). Risk chart for identification of potential landslide due to the presence of residual soil. *Natural Hazards*. 103: 3479-3498. doi:<https://doi.org/10.1007/s11069-020-04139-w>
- Ray A., Kumar V., Kumar A., Rai R., Khandelwal M., Singh T. (2020b). Stability prediction of Himalayan residual soil slope using artificial neural network. *Natural Hazards*. 103: 3523-3540. doi:<https://doi.org/10.1007/s11069-020-04141-2>
- Regmi A. D., Yoshida K., Dhital M. R., Devkota K. (2013). Effect of rock weathering, clay mineralogy, and geological structures in the formation of large landslide, a case study from Dumre Besei landslide, Lesser Himalaya Nepal. *Landslides*. 10: 1-13. doi:<https://doi.org/10.1007/s10346-011-0311-7>
- Regmi A. D., Yoshida K., Dhital M. R., Pradhan B. (2014). Weathering and mineralogical variation in gneissic rocks and their effect in Sangrumba Landslide, East Nepal. *Environmental earth sciences*. 71: 2711-2727. doi:<https://doi.org/10.1007/s12665-013-2649-8>
- Rib H. T., Liang T. (1978). Recognition and identification. *Transportation Research Board Special Report*.
- Romana M. New adjustment ratings for application of Bieniawski classification to slopes. In: Proceedings of the international symposium on role of rock mechanics, Zacatecas, Mexico, 1985. pp 49-53
- Romana M. SMR classification. In: 7th ISRM Congress, 1991. OnePetro,
- Rukhaiyar S., Alam M., Samadhiya N. (2018). A PSO-ANN hybrid model for predicting factor of safety of slope. *International Journal of Geotechnical Engineering*. 12: 556-566. doi:<https://doi.org/10.1080/19386362.2017.1305652>
- Rupke J. (1974). Stratigraphic and structural evolution of the Kumaon Lesser Himalaya. *Sedimentary Geology*. 11: 81-265
- Ruppert D. (2004). Statistics and finance: An introduction vol 27. Springer,
- Sah N., Kumar M., Upadhyay R., Dutt S. (2018). Hill slope instability of Nainital City, Kumaun Lesser Himalaya, Uttarakhand, India. *Journal of Rock Mechanics and Geotechnical Engineering*. 10: 280-289. doi:<https://doi.org/10.1016/j.jrmge.2017.09.011>
- Sai R., Shukla S., Prasad G., Vishnoi R., Routela T. Integrated approach for stabilisation of varunavat parvat landslide—a case study. In: International Conference on Case Histories in Geotechnical Engineering, Arlington, Virginia, 2008.
- Sajinkumar K., Anbazhagan S., Pradeepkumar A., Rani V. (2011). Weathering and landslide occurrences in parts of Western Ghats, Kerala. *Journal of the Geological Society of India*. 78: 249. doi:<https://doi.org/10.1007/s12594-011-0089-1>
- Sakellariou M., Ferentinou M. (2005). A study of slope stability prediction using neural networks. *Geotechnical & Geological Engineering*. 23: 419-445. doi:<https://doi.org/10.1007/s10706-004-8680-5>
- Sarkar S., Kanungo D., Chauhan P. (2011). Varunavat landslide disaster in Uttarkashi, Garhwal Himalaya, India. *Quarterly Journal of Engineering Geology and Hydrogeology*. 44: 17-22. doi:<https://doi.org/10.1144/1470-9236/09-029>
- Sarkar S., Kanungo D., Mehrotra G. (1995). Landslide hazard zonation: a case study in Garhwal Himalaya, India. *Mountain Research and Development*. 301-309. doi:<https://doi.org/10.2307/3673806>
- Sati S., Sundiyal Y. (2007). Role of some tree species in slope instability. *Himalayan Geology*. 28: 75-78
- Saunders M., Fookes P. (1970). A review of the relationship of rock weathering and climate and its significance to foundation engineering. *Engineering Geology*. 4: 289-325

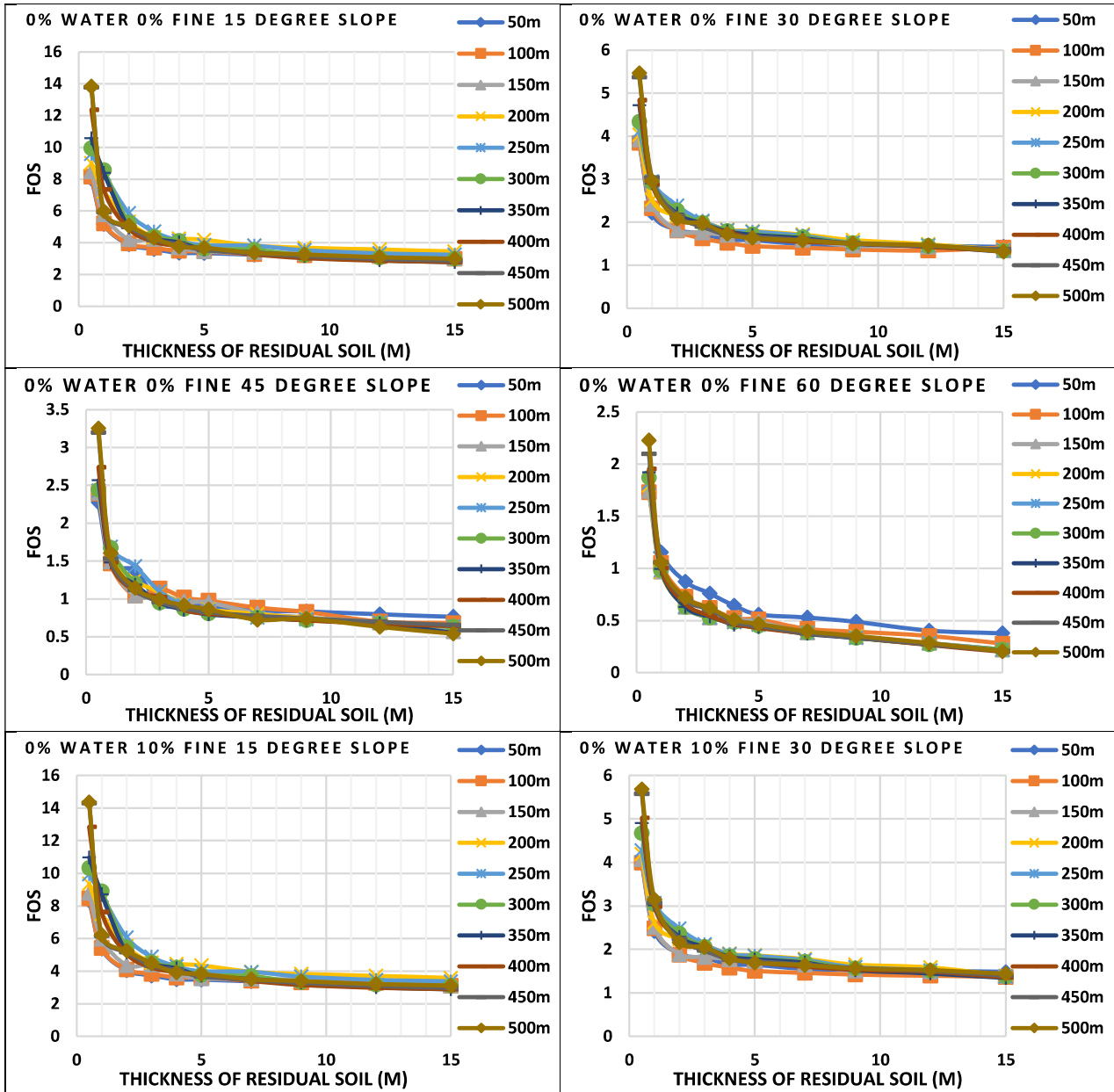
- Schuster R. L., Fleming R. W. (1986). Economic losses and fatalities due to landslides. *Bulletin of the Association of Engineering Geologists*. 23: 11-28
- Selezneva O., Darter M., Zollinger D., Shoukry S. (2003). Characterization of transverse cracking spatial variability: Use of long-term pavement performance data for continuously reinforced concrete pavement design. *Transportation Research Record*. 1849: 147-155
- Sengupta A., Gupta S., Anbarasu K. (2010). Rainfall thresholds for the initiation of landslide at Lanta Khola in north Sikkim, India. *Natural hazards*. 52: 31-42. doi:<https://doi.org/10.1007/s11069-009-9352-9>
- Sharma A., Ram S. (2014). Mining effects on forest area of Mussoorie division. *Int J Sci Res Dev*. 250-255
- Sharma L., Umrao R. K., Singh R., Ahmad M., Singh T. (2017). Stability investigation of hill cut soil slopes along National highway 222 at Malshej Ghat, Maharashtra. *Journal of the Geological Society of India*. 89: 165-174. doi:<https://doi.org/10.1007/s12594-017-0580-4>
- Sharma R., Sharma U. K., Mahajan A. (2015). Rainfall and anthropogenically accelerated mass movement in the Outer Himalaya, north of Dharamshala town, Kangra district, Himachal Pradesh: A cause of concern. *Journal of the Geological Society of India*. 86: 563-569. doi:<https://doi.org/10.1007/s12594-015-0347-8>
- Sharma U. K. (2007). Landform and slope instability in Himachal Himalaya—A case study of Baner Khad watershed, Himachal Pradesh, India. *Zeitschrift für Geomorphologie*. 51: 95-114. doi:<https://doi.org/10.1127/0372-8854/2007/0051-0095>
- Siddique T., Alam M. M., Mondal M., Vishal V. (2015). Slope mass rating and kinematic analysis of slopes along the national highway-58 near Jonk, Rishikesh, India. *Journal of Rock Mechanics and Geotechnical Engineering*. 7: 600-606. doi:<https://doi.org/10.1016/j.jrmge.2015.06.007>
- Siddiqui F. I., Pathan D. M., Osman S. B. A. B. S., Pinjaro M. A., Memon S. (2015). Comparison between regression and ANN models for relationship of soil properties and electrical resistivity. *Arabian Journal of Geosciences*. 8: 6145-6155. doi:<https://doi.org/10.1007/s12517-014-1637-y>
- Siddique T., Pradhan S. (2018). Stability and sensitivity analysis of Himalayan road cut debris slopes: an investigation along NH-58, India. *Natural Hazards*. 93: 577-600. doi:<https://doi.org/10.1007/s11069-018-3317-9>
- Singh A. K. (2009). Causes of slope instability in the Himalayas. *Disaster Prevention and Management: An International Journal*. 18: 283-298. doi:<https://doi.org/10.1108/09653560910965646>
- Singh P., Kainthola A., Singh T. (2015). Risk analysis of High Hill Slopes—a case history. *J Rock Mech Tunnel Technol*. 21: 101-113
- Singh R., Umrao R., Singh T. (2013). Probabilistic analysis of slope in Amiyani landslide area, Uttarakhand. *Geomatics, Natural Hazards and Risk*. 4: 13-29. doi:<https://doi.org/10.1080/19475705.2012.661796>
- Singh T., Gulati A., Dontha L., Bhardwaj V. (2008). Evaluating cut slope failure by numerical analysis—a case study. *Natural Hazards*. 47: 263. doi:<https://doi.org/10.1007/s11069-008-9219-5>
- Skilodimou H. D., Bathrellos G. D., Koskeridou E., Soukis K., Rozos D. (2018). Physical and anthropogenic factors related to landslide activity in the Northern Peloponnese, Greece. *Land*. 7: 85. doi:<https://doi.org/10.3390/land7030085>
- Soeters R., Van Westen C. (1996). Slope instability recognition, analysis and zonation. *Landslides: investigation and mitigation*. 247: 129-177
- Solanki A., Gupta V., Bhakuni S., Ram P., Joshi M. (2019). Geological and geotechnical characterisation of the Khotila landslide in the Dharchula region, NE Kumaun Himalaya. *Journal of Earth System Science*. 128: 1-14
- Song D., Zhou G. G., Xu M., Choi C. E., Li S., Zheng Y. (2019). Quantitative analysis of debris-flow flexible barrier capacity from momentum and energy perspectives. *Engineering Geology*. 251: 81-92

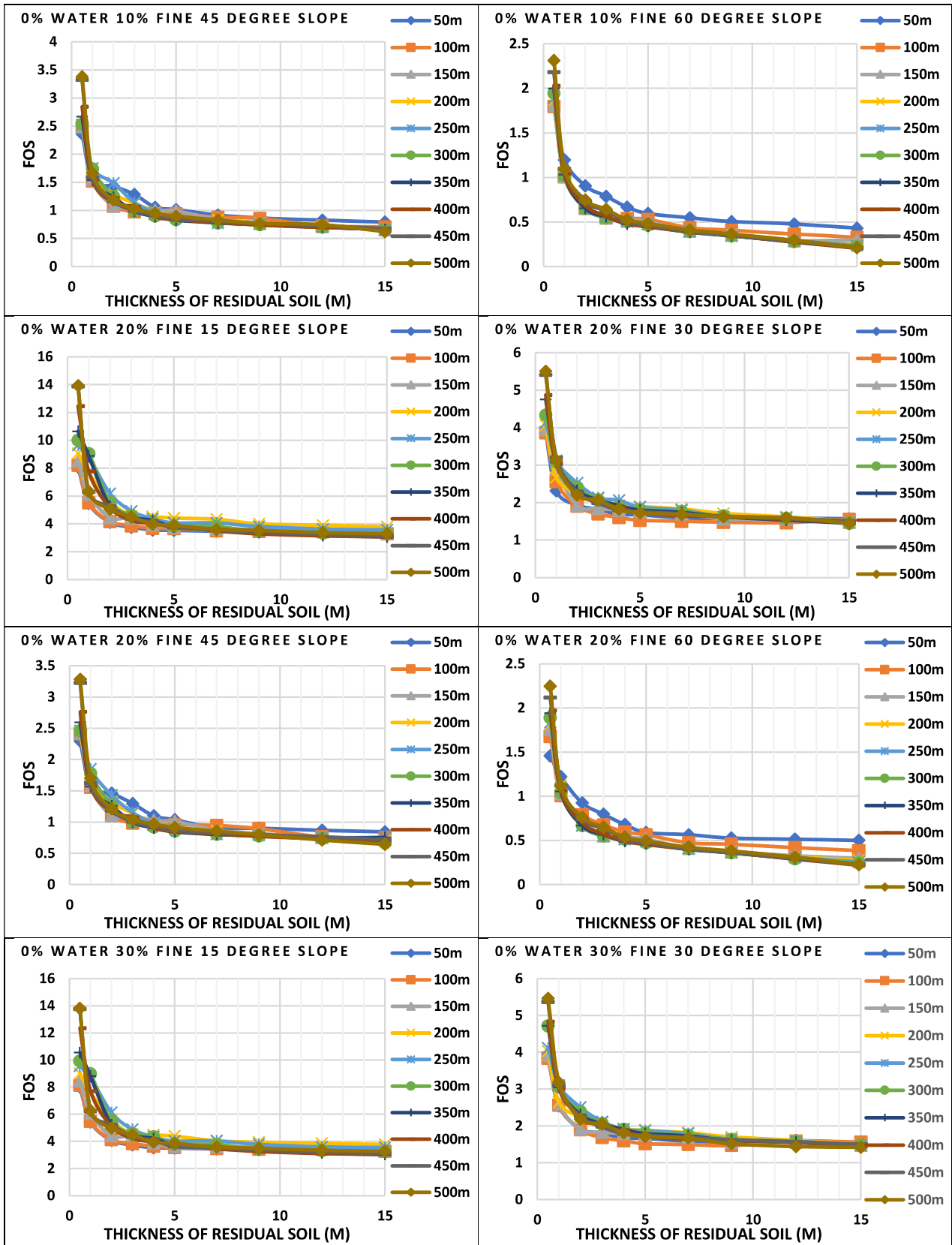
- Sumantra S., Raghunath P. (2016). Causes of Landslides in Darjeeling Himalayas during June-July, 2015. *Journal of Geography and Natural Disasters*. 6: 2167-0587.1000173
- Surya P. (2012). Training module on comprehensive landslides risk management. *National Institute of Disaster Management, New Delhi-110002*. 282
- Talib Z., Kassim A., Yunusa G. Influence of Relict Joints on Permeability of Residual Soil. In: IOP Conference Series: Materials Science and Engineering, 2016. vol 1. IOP Publishing, p 012015
- Tang W., Yucemen M., Ang A.-S. (1976). Probability-based short term design of soil slopes. *Canadian Geotechnical Journal*. 13: 201-215
- Tiwari G., Latha G. M. (2017). Reliability analysis of jointed rock slope considering uncertainty in peak and residual strength parameters. *Bulletin of Engineering Geology and the Environment*. 1-18. doi:<https://doi.org/10.1007/s10064-017-1141-1>
- Tiwari R., Bhandary N., Yatabe R., Bhat D. (2013). Evaluation of factor of safety for vegetated and barren soil slopes with limit equilibrium computations. *Geomechanics and Geoengineering*. 8: 254-273. doi:<https://doi.org/10.1080/17486025.2012.744101>
- Tomás R., Delgado J., Serón Gáñez J. B. (2007). Modification of slope mass rating (SMR) by continuous functions.
- Trigila A., Iadanza C., Esposito C., Scarascia-Mugnozza G. (2015). Comparison of Logistic Regression and Random Forests techniques for shallow landslide susceptibility assessment in Giampileri (NE Sicily, Italy). *Geomorphology*. 249: 119-136. doi:<https://doi.org/10.1016/j.geomorph.2015.06.001>
- Ulusay R. (2014). The ISRM suggested methods for rock characterization, testing and monitoring: 2007-2014. Springer,
- Ural D. N., Tolon M. (2008) Slope Stability during Earthquakes: a neural network application. In: GeoCongress 2008: Characterization, Monitoring, and Modeling of GeoSystems. pp 878-885
- Vagnon F. (2020). Design of active debris flow mitigation measures: a comprehensive analysis of existing impact models. *Landslides*. 17: 313-333. doi:<https://doi.org/10.1007/s10346-019-01278-5>
- Valdiya K. (2016) Early Proterozoic in the Himalaya: Rocks, metamorphism and igneous activities. In: The Making of India. Springer, pp 299-334
- Vanmarcke E. (1980). Probabilistic stability analysis of earth slopes. *Engineering Geology*. 16: 29-50. doi:[https://doi.org/10.1016/0013-7952\(80\)90005-8](https://doi.org/10.1016/0013-7952(80)90005-8)
- Vanmarcke E. H. (1977). Probabilistic modeling of soil profiles. *Journal of the geotechnical engineering division*. 103: 1227-1246
- Vasistha H., Rawat A., Soni P. (2011). Hazards Mitigation through Application of Bioengineering Measures in Landslide Areas. *Disaster and Development*. 5: 37-52
- Verma A., Singh T., Chauhan N. K., Sarkar K. (2016). A hybrid FEM-ANN approach for slope instability prediction. *Journal of The Institution of Engineers (India): Series A*. 97: 171-180. doi:<https://doi.org/10.1007/s40030-016-0168-9>
- Vyshnavi S., Islam R., Sundriyal Y. (2015). Role of physical and chemical weathering in development of soil profile in the Garhwal Lesser Himalaya. *Himalayan Geology*. 36: 111-117
- Wang J., Yang S., Ou G., Gong Q., Yuan S. (2018). Debris flow hazard assessment by combining numerical simulation and land utilization. *Bulletin of Engineering Geology and the Environment*. 77: 13-27. doi:<https://doi.org/10.1007/s10064-017-1006-7>
- Wang Y., Zhao T., Cao Z. (2015). Site-specific probability distribution of geotechnical properties. *Computers and Geotechnics*. 70: 159-168
- Wieczorek G. F. (1984). Preparing a detailed landslide-inventory map for hazard evaluation and reduction. *Bulletin of the Association of Engineering Geologists*. 21: 337-342
- Wong H., Ho K., Chan Y. Assessment of consequence of landslides. In: Cruden R, Fell R (eds) Landslide risk assessment, AA Balkema, Rotterdam, 1997. pp 111-149

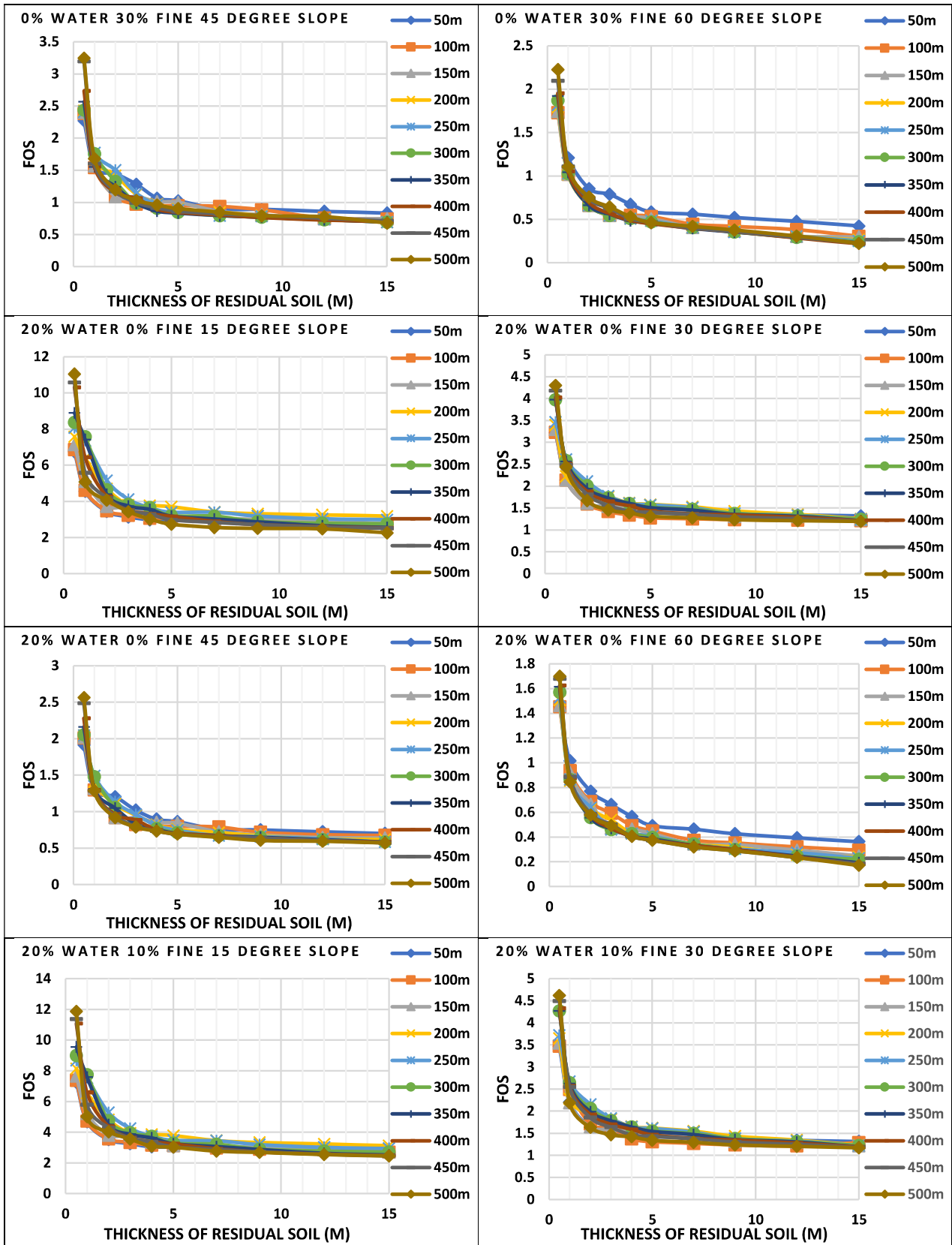
- Wright R. H., Campbell R. H., Nilsen T. H. (1974). Preparation and use of isopleth maps of landslide deposits. *Geology*. 2: 483-485
- Xu Z., Wang W., Lin P., Xiong Y., Liu Z., He S. (2020). A parameter calibration method for PFC simulation: Development and a case study of limestone. *Geomechanics and Engineering*. 22: 97-108
- Yalcin A. (2007). The effects of clay on landslides: A case study. *Applied Clay Science*. 38: 77-85
- Yilmaz I. (2010). The effect of the sampling strategies on the landslide susceptibility mapping by conditional probability and artificial neural networks. *Environmental Earth Sciences*. 60: 505-519. doi:<https://doi.org/10.1007/s12665-009-0191-5>
- Yokota S., Iwamatsu A. (2000) Weathering distribution in a steep slope of soft pyroclastic rocks as an indicator of slope instability. In: *Developments in geotechnical engineering*, vol 84. Elsevier, pp 187-198
- Zare M., Pourghasemi H. R., Vafakhah M., Pradhan B. (2013). Landslide susceptibility mapping at Vaz Watershed (Iran) using an artificial neural network model: a comparison between multilayer perceptron (MLP) and radial basic function (RBF) algorithms. *Arabian Journal of Geosciences*. 6: 2873-2888. doi:<https://doi.org/10.1007/s12517-012-0610-x>
- Zhou G. G., Li S., Song D., Choi C. E., Chen X. (2019a). Depositional mechanisms and morphology of debris flow: physical modelling. *Landslides*. 16: 315-332. doi:<https://doi.org/10.1007/s10346-018-1095-9>
- Zhou S., Gao L., Zhang L. M. (2019b). Predicting debris-flow clusters under extreme rainstorms: a case study on Hong Kong Island. *Bulletin of Engineering Geology and the Environment*. 78: 5775-5794. doi:<https://doi.org/10.1007/s10064-019-01504-3>

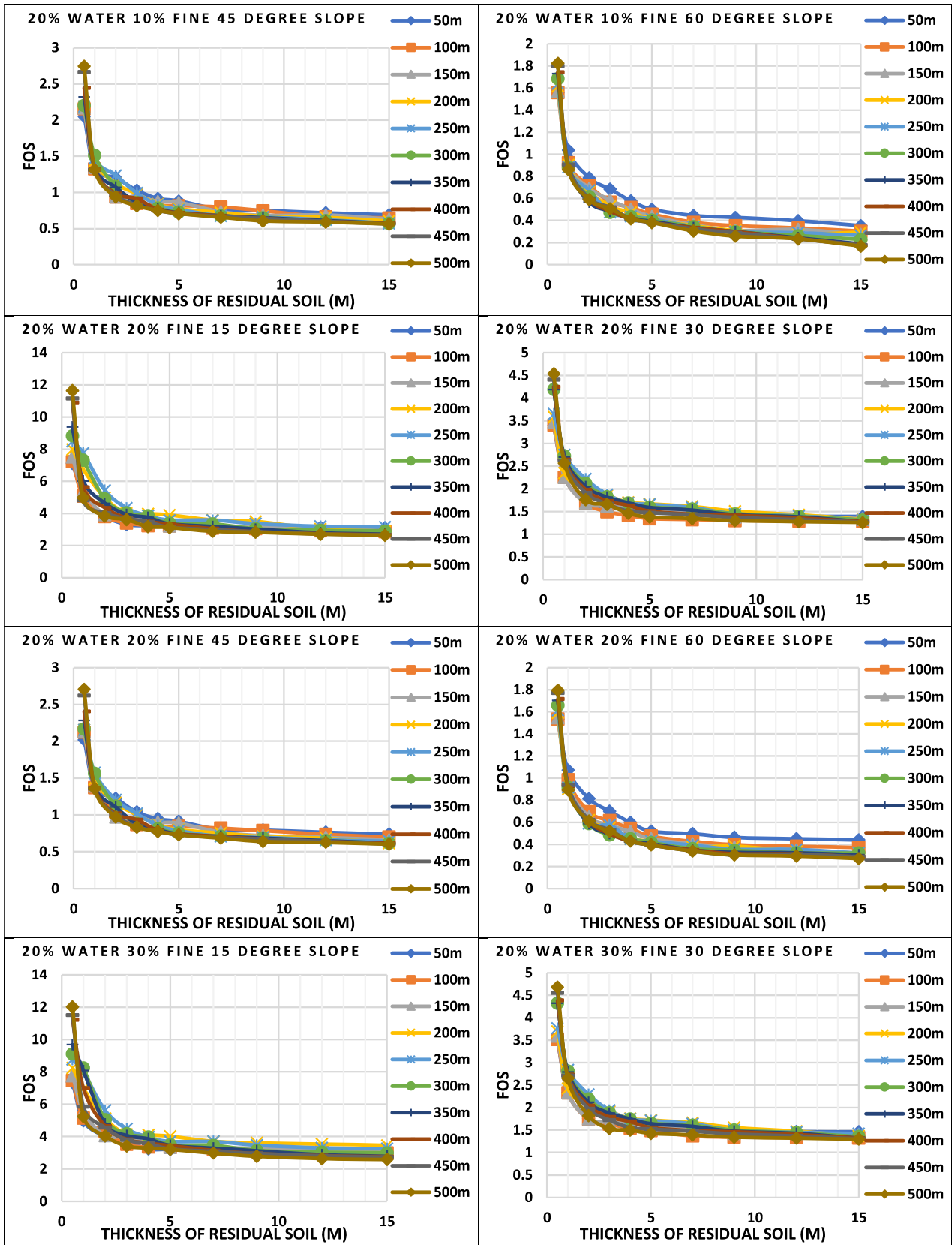
APPENDIX I

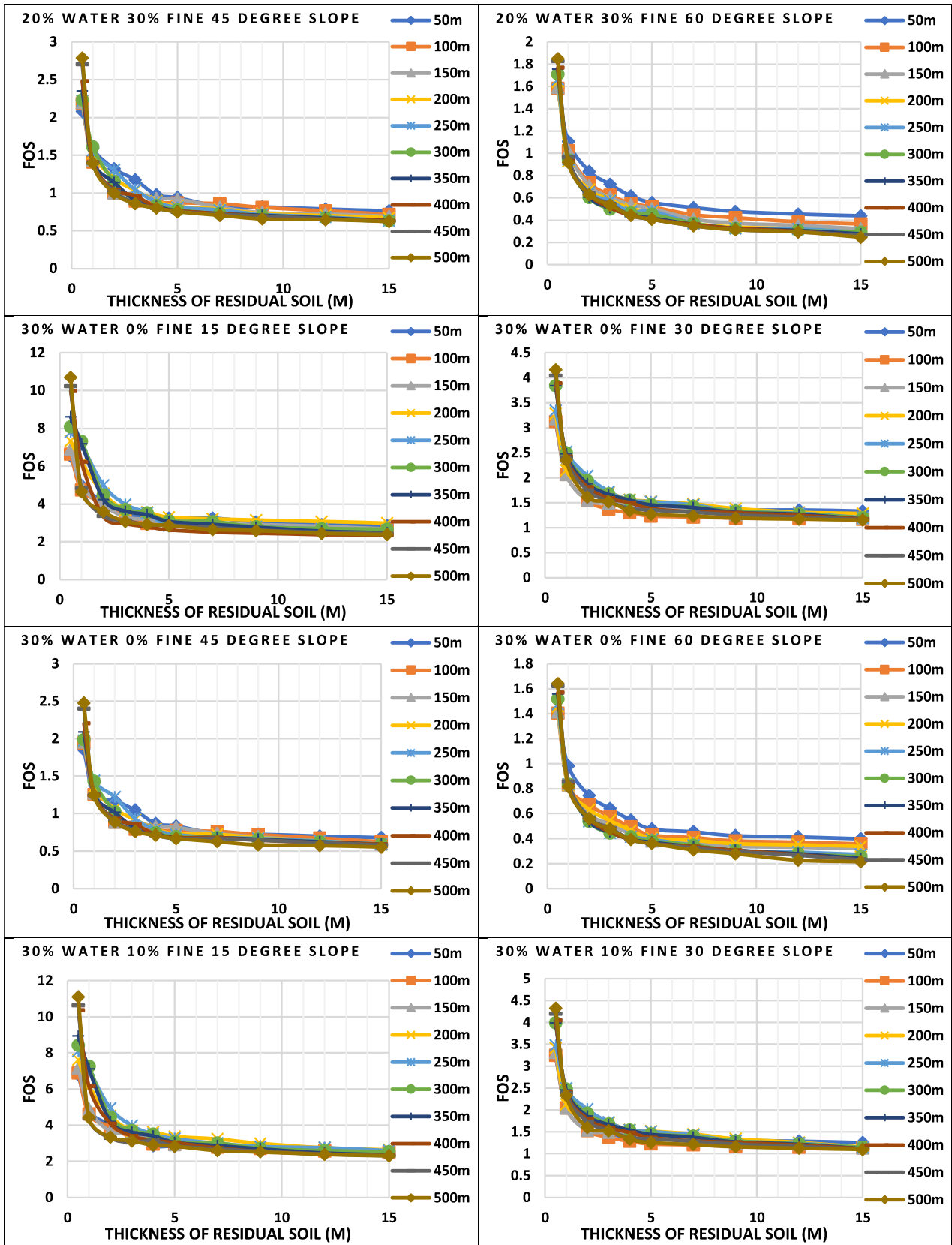
FOS Vs. The thickness of residual soil for various combinations of slope angle and percentage of fines in residual soil under 0%, 20% and 30% soil water content

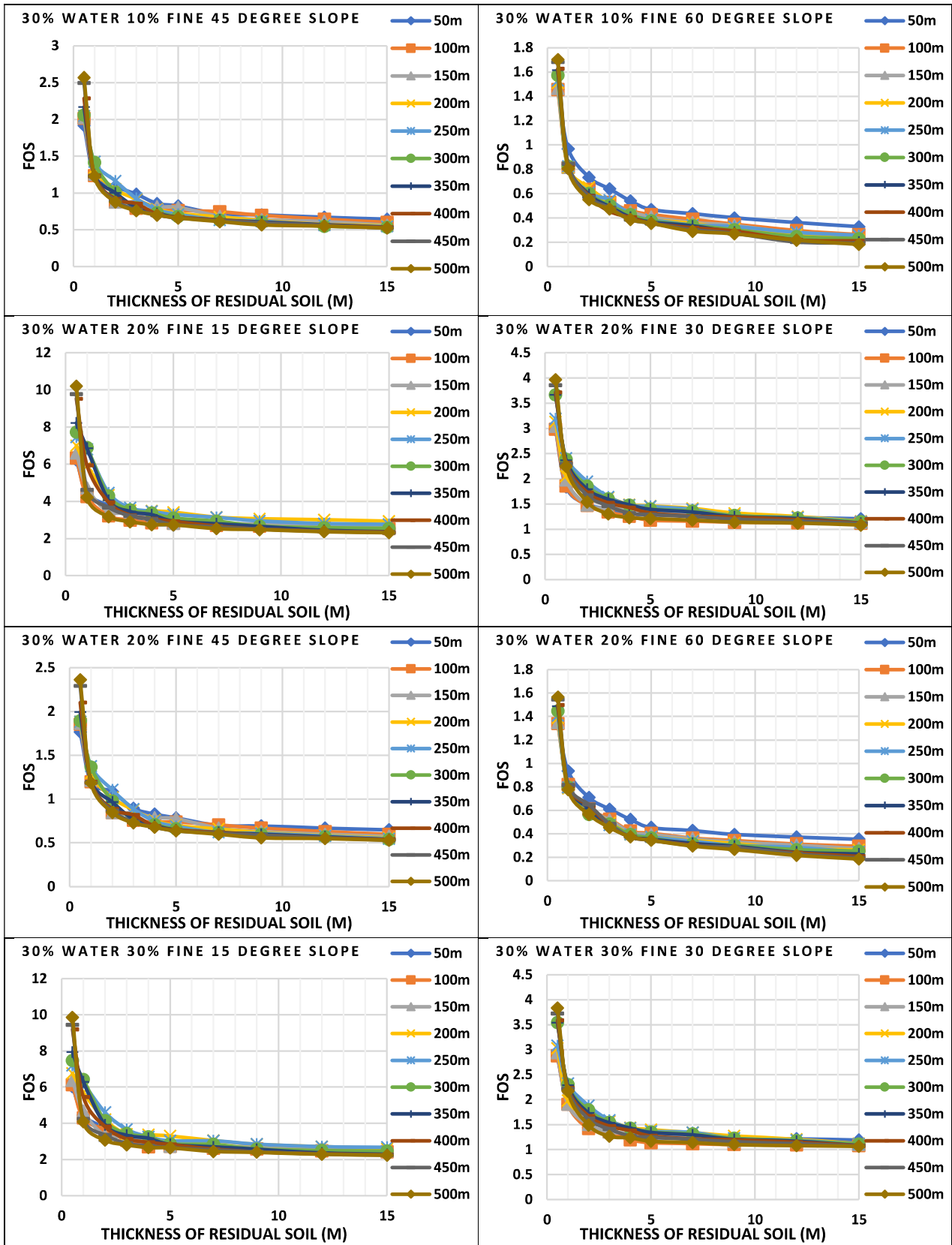


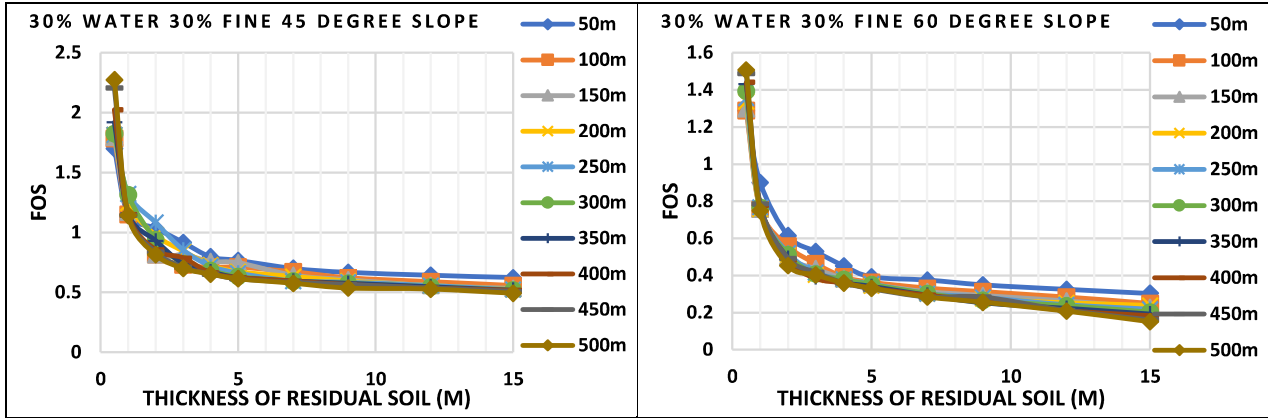












LISTS OF PUBLICATIONS

Based on Literature Review:

Ray, A., Bharati, A. K., Rai, R., & Singh, T. N. (2021). Landslide occurrences in Himalayan residual soil: a review. *Himalayan Geology*, 42(1), 189-204.

Based on Numerical Analysis:

Ray, A., Kumar, R. C., Rai, R., & Gupta, S. (2020). Risk chart for identification of potential landslide due to the presence of residual soil. *Natural Hazards*, 103(3), 3479-3498.

Ray, A., R., & Singh, T. N. (2021). The effect of discontinuity orientation and thickness of the weathered layer on the stability of Lesser Himalayan rock slope, (**Accepted:** *Journal of the Geological Society of India*)

Based on ANN Prediction Model:

Ray, A., Kumar, V., Kumar, A., Rai, R., Khandelwal, M., & Singh, T. N. (2020). Stability prediction of Himalayan residual soil slope using artificial neural network. *Natural Hazards*, 103(3), 3523-3540.

Based on Debris Flow Analysis:

Ray, A., Verma, H., Bharati, A. K., Rai, R., Koner, R., & Singh, T. N. (2021). Numerical modelling of rheological properties of landslide debris. *Natural Hazards*, 1-25.