

KESHAB SHARMA, Ph.D., E.I.T. (AB)

Geotechnical Engineer, BGC Engineering Inc., Fredericton, NB, Canada

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EDUCATION

- **Ph.D. in Geotechnical Engineering***, 2019, University of Alberta, AB, Canada
**Nominated for Governor General's Gold Medal (for outstanding scholastic achievements of students in Canada) from Department of Civil and Environmental Engineering*
** Nominated for CAGS/UMI Distinguished Dissertation Award.*
- **MSc. in Geotechnical Engineering**, 2012, University of Tokyo, Tokyo, Japan
Thesis title: *Slaking characteristics of geo-material in direct shear tests*
Advisor: Assoc. Prof. Takashi Kiyota
- **Bachelor's in civil engineering**, 2007, Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal

RESEARCH INTERESTS

- Disaster preparedness, response, and recovery
- Reconstruction and rehabilitation
- Policy and community involvement in disaster management
- Geodisaster
- Geotechnical earthquake engineering
- Slaking-induced failures
- Nanotechnology in geo-engineering
- Geotechnical sensing system

PUBLICATIONS

Journal papers

- **Sharma, K.**, Deng, L. (2020). Effects of loading obliquity on field performance of rocking shallow foundations in cohesive Soil. *Geotechnique*, 1-14 (<https://doi.org/10.1680/jgeot.19.P.033>).
- **Sharma, K.**, Deng, L. (2020). Field cyclic testing of rocking foundations in cohesive soils: foundation performance and footing internal behaviour. *Canadian Geotechnical Journal*, 57(6): 828-839.

- Gavras, A.G., Kutter, B. L., Hakhamaneshi, M., Gajan, S., Tsatsis, A., **Sharma, K.**, Kouno, T., Deng, L., Anastasopoulos, I., Gazetas, G., Variam, K. A. (2020). Foundation Rocking Database of Dynamic Experiments, *Earthquake Spectra*, **36** (2), 960-982.
- Hakhamaneshi, M., Kutter, B. L., Gavras, A.G., Gajan, S., Tsatsis, A., Liu, W., **Sharma, K.**, Pianese, G., Kouno, T., Deng, L., Paolucci, R., Anastasopoulos, I., Gazetas, G. (2020). Foundation Rocking Database of Slow Cyclic and Monotonic Loading Experiments, *Earthquake Spectra* (accepted).
- **Sharma, K.**, Deng, L. (2020). Performance-Based Seismic Design of Rocking Shallow Foundations in Clay: Methodology and Examples, *Canadian Geotechnical Journal* (in review).
- KC, A., **Sharma, K.**, and Pokharel, B. (2020). **Status and challenges of reconstruction of heritage structures in Nepal after 2015 Gorkha, Nepal earthquake**, *Heritage and Society* (In review).
- Acharya, P., **Sharma, K.**, Acharya, I.P., and Adhikari, R. (2020). Seismic liquefaction potential of fluvio-lacustrine deposit in the Kathmandu Valley, Nepal. *Journal of Earthquake Engineering* (In review)
- Acharya, M., Donnelly, C.R. Groeneveld, J., Bennett, A. McAllister, A.E., Rutherford, J. H., and **Sharma, K.** (2020). **Dam Safety Emergency Management Program for Residual Risk Reduction: Global Perspective with Nepalese Context**, *Journal of Water Resources Planning and Management* (In review).
- Acharya, P., **Sharma, K.**, and Acharya, I.P. (2020). Seismic Liquefaction Scenario of Critical Facilities in Kathmandu Valley, Nepal, *Bulletin of Engineering Geology and the Environment* (In review).
- **Sharma, K.**, Deng, L. (2019). Characterization of rocking shallow foundations on cohesive soil using field snap-back tests. *J. of Geotechnical and Geoenvironmental Engineering ASC*, **145**(9): 04019058.
- **Sharma, K.**, Deng, L. (2019). Reconnaissance Report on Geotechnical Engineering Aspect of the April 25, 2015, Gorkha, Nepal earthquake. *Journal of Earthquake Engineering*, **23**(3): 512-537.
- **Sharma, K.**, Deng, L., and Khadka, D. (2019). Reconnaissance of liquefaction case studies in 2015 Gorkha (Nepal) earthquake and assessment of liquefaction susceptibility. *International Journal of Geotechnical Engineering*, **13** (4): 326-338.
- KC, A., **Sharma, K.**, Pokharel, B. (2019). Performance of heritage structure in Kathmandu Valley during 2015 Gorkha Nepal earthquake. *Journal of Earthquake Engineering*, **23** (8):1346-1384.
- **Sharma, K.**, KC, A., and Pokharel, B. (2018). **Challenges for reconstruction after Mw 7.8 Gorkha earthquake: a study on devastated area of Nepal**. *Geomatics, Natural Hazards and Risk*, **9** (1): 760-790.
- **Sharma, K.**, Kiyota, T., Kyokawa, H. (2017). Effect of slaking on direct shear behaviour of crushed mudstones. *Soils and Foundations*, **57** (2): 288-300.

- **Sharma, K.**, Subedi, M., Parajuli, R. R. and Pokharel, B. (2017). Effects of surface geology and topography on the damage severity during the 2015 Nepal Gorkha earthquake. *Journal of Lowland Technology International*, **18** (4):269-282.
- **Sharma, K.**, KC, A. Subedi, M. and Pokharel, B. (2017): **Post disaster reconstruction after 2015 Gorkha earthquake: Challenges and influencing factors**, *Journal of Institute of Engineering*, 13 (1): 67-78.
- **Sharma, K.**, Deng, L., Cruz-Noguez, C. (2016). Field investigation on the performance of building structures during the April 25, 2015, Gorkha earthquake in Nepal. *Engineering Structures*, **121**:61-74.

Journal Paper in progress

- **Sharma, K.**, and Deng, L. (2020). Numerical modeling of field behaviour of rocking shallow foundation in cohesive soil.
- **Sharma, K.**, KC, A., and Parajuli, R.R. (2020). Performance assessment of building infrastructure impacted by the 2019 windstorm in the Central-South of Nepal. For submission to *Journal of Performance of Constructed Facilities, ASCE*.
- Acharya, P., **Sharma, K.**, Pokharel, G. R. and Adhikari, R. (2020). Measuring the Progress of the Recovery Process After Five years of 2015 Gorkha, Nepal earthquake, For submission to *International Journal of Disaster Risk Reduction*.
- Acharya, P., **Sharma, K.**, Pokharel, G. R. and Adhikari, R. (2020). Modality of post 2015 Gorkha, Nepal earthquake reconstruction and lessons learned. For submission to *Geomatics, Natural Hazards and Risk*.

Peer Reviewed Conference Publications

- **Sharma, K.**, Deng, L. (2019): Rocking shallow foundation in cohesive soil subjected to cyclic loading in the field. 12th CCEE, Quebec, QC, 17-20 June, 2019.
- KC, A., **Sharma, K.** (2019): Reconstruction of heritage structures in Nepal after 2015 Gorkha, Nepal earthquake. 12th CCEE, Quebec, QC, 17-20 June, 2019.
- **Sharma, K.**, Deng, L. (2018): Rocking shallow foundations in earthquake zone: field snap-back testing in cohesive soil. *Proc. of the Geohazards 7*, June 3-6, Canmore, AB, Canada.
- **Sharma, K.**, Deng, L. (2018). Rocking foundation on a natural clay subjected to lateral cyclic loads. *Proc. of the 5th Geotechnical earthquake engineering and soil dynamics conference*, June 10-13, 2018, Austin, TX, USA.
- Subedi, M., **Sharma, K.**, Acharya, I.P., and Adhikari, K. (2018): Soil Liquefaction in Kathmandu Valley due to 2015 Gorkha, Nepal Earthquake and Assessment of Liquefaction Susceptibility. *Proc. of the 11th National Conference in Earthquake Engineering*, Earthquake Engineering Research Institute, Los Angeles, CA.
- **Sharma, K.**, Deng L (2017): Field Investigation of Rocking Shallow Foundations on a Natural Soil Deposits, *Proc. of Geo-Ottawa 2017*, October 1-4, Ottawa, Canada.
- **Sharma, K.**, Kiyota, T. and Kyokawa, H. (2013): Influence of cyclic wetting and drying on the mechanical properties of crushed mudstones under constant stress condition; Third

International Conference on Geotechnique, Construction Materials and Environment GEOMATE 2013, 13-15, November 2013, Nagoya, Japan.

- **Sharma, K.**, Kiyota, T. and Kyokawa, H. (2012): Influence of cyclic wetting and drying on stress and deformation characteristics of crushed mudstones in direct shear test; Proc. of the 5th Taiwan- Japan Joint Workshop on Geotechnical Hazards from Large Earthquakes and Heavy Rainfalls, 12-15, November, 2012, Tainan, Taiwan, SIV25-SIV28
- Lee, J., **Sharma, K.**, Kiyota, T. and Kyokawa, H. (2012): Investigating the effects of slaking behaviour on mudstone slopes; Proc. of the 5th Taiwan- Japan Joint Workshop on Geotechnical Hazards from Large Earthquakes and Heavy Rainfalls, 12-15, November, 2012, Tainan, Taiwan, SIV21-SIV24.
- **Sharma, K.**, Kiyota, T. and Kyokawa, H. (2012): Cyclic wetting and drying induced creep deformation of crushed mudstone in direct shear test; *14th International Summer Symposium in conjunction with JSCE 67th Annual Conference Japan Society of Civil Engineers (JSCE)*, 5-6 September 2012, Nagoya, Japan, 48-49.
- Lee, J., **Sharma, K.**, Kiyota, T. and Kyokawa, H. (2012): Interpretation of slaking behaviour of crushed mudstone in direct shear; *14th International Summer Symposium in conjunction with JSCE 67th Annual Conference Japan Society of Civil Engineers (JSCE)*, 5-6 September 2012, Nagoya, Japan, 41-42.
- **Sharma, K.**, Okuno, D., Munekata, W., and Kiyota, T. (2012): Slaking effect on shear deformation and creep deformation of mudstone; *the Proc. 13th international summer symposium, Japan Society of Civil Engineers (JSCE)*, Kyoto, Japan, 39-42.
- Kyokawa, H., **Sharma, K.**, Lee, J., Kiyota, T. (2012): Effect of repeated wetting and drying on the mechanical properties of the soil gravelly mudstone; *The 47th Research Conference on Geotechnical Engineering, Japanese Geotechnical Society (JGS)*, 14-16, July 2012, Japan.
- Aglipay, M.R.I., Konagai, K., Kyokawa, H., **Sharma, K.** (2011): Road Bridges in Minami-Sanrku washed away in the March 11th, 2011 Great East Japan earthquake and tsunami; *the Proc. of 31st Conference on Earthquake Engineering, JSCE*, Tokyo, Japan.

Technical Reports

- **Sharma, K.**, and Deng, L. (2016). Field Test report of Almita Helical piles. Submitted to Canadian Construction Materials Centre (CCMC), National Research Council of Canada, Ottawa, Ontario.

SELECTED OP-ED ARTICLES

- 1) “Five years since the Gorkha earthquake, Nepal still falls short” in The Kathmandu Post National Daily Newspaper, May 17, 2020.
- 2) “Earthquake resistant construction” in Nayapatrika National Daily Newspaper, January 17, 2020 (In Nepali language).

- 3) **“Existence of Kathmandu Valley and smart city”** in Nayapatrika National Daily Newspaper, September 17, 2019 (In Nepali language).
- 4) **“What ails heritage reconstruction?”** in Republica National Daily Newspaper in Nepal, August 21, 2019.
- 5) **“High dam induced dam”** in Setopati online newspaper, August 12, 2019 (In Nepali language).
- 6) **“Urban flooding in Kathmandu Valley”** in Setopati online newspaper, July 15, 2019 (In Nepali language).
- 7) **“Building safe homes”** in Republica National Daily Newspaper in Nepal, April 25, 2019.
- 8) **“Challenges to dam safety in Nepal”** in Nagarik Daily Newspaper in Nepal, March 5, 2015 (in Nepali language).
- 9) **“No lesson learnt from part earthquake”** in Annapurna Post National Daily Newspaper, April 24, 2018 (in Nepali language).
- 10) **“Uses of technology in development”** in the Baahrakhari Online Newspaper, April 5, 2018 (in Nepali language).
- 11) **“Risk of gas plant and petrol pump”** in Baahrakhari Online Newspaper, December 28, 2017 (in Nepali language).
- 12) **“What can we learn from Chile?”** in Baahrakhari Online Newspaper, February 19, 2017 (in Nepali language).
- 13) **“When will Nepal rise from the rubble?”** in Annapurna Post Online Newspaper, November 16, 2016.
- 14) **“Higher education, University and Research”** in Baahrakhari Online Newspaper, October 24, 2016 (in Nepal Language).
- 15) **“Learning from others”** in Republica National Daily Newspaper in Nepal, February 20, 2016.
- 16) **“How to make Kathmandu disaster resilient”** in Setopati Online Newspaper, January 25, 2016 (in Nepal Language).
- 17) **“Increased disaster risk in the Kathmandu Valley”** in Setopati Online Newspaper, January 23, 2016 (in Nepal Language).
- 18) **“Broken Lives”** in Republica National Daily Newspaper in Nepal, December 26, 2015.
- 19) **“Challenges in Reconstruction”** in Nagarik Daily Newspaper in Nepal, September 16, 2015 (in Nepali language).
- 20) **“School at Risk”** in Republica National Daily Newspaper in Nepal, July 4, 2015.
- 21) **“Earthquake and its long-term effects”** in Nagarik Daily Newspaper in Nepal, June 14, 2015 (in Nepali language).

- 22) **“We and Earthquake Risk”** in Himalayan Times Nepali National Newspaper on 2nd Mag, 2069 B.S. (February 15, 2013) on the occasion of National Earthquake Safety Day (in Nepali language).

TEACHING, MENTORING and TUTORING

- TA of CIV E 381 SOIL MECHANICS (2014 Winter and Fall term; 2015 Winter and Fall term; 2016 Winter and Fall term)
- TA of CIV E 481 SOIL ENGINEERING (2017 Winter and Fall term; 2018 Fall term)
- TA of CIV E 270 MECHANICS DEFORMABLE BODIES I (2018 Winter term)
- Lecturer of CIV E 381 SOIL MECHANICS (2018 Winter, 2 lectures)
- Lecturer of Geotechnical Earthquake Engineering and Application of Geosynthetic in Civil Engineering for MSc student, Institute of Engineering, Nepal, 2013 (2 Semesters)
 - Developed curriculum, instructed and assessed students
 - Prepared and delivered lectures to students and conducted laboratory sessions or discussion groups for a class of 48 students
 - Prepared, administered and graded examinations, laboratory assignments and reports
 - Advised students on the course and academic matters and career decisions
 - Directed research programs of graduate students and advised on research matters
- Teaching Assistant of Soil Mechanics, Foundation Engineering, Theory of Structures I and II, Applied Mechanics (Statics and Dynamics), Solid Mechanics for bachelor’s degree, Kathmandu Engineering College, Kathmandu Nepal (2008-2010; 5 Semesters)
 - Prepared and delivered lectures to students and conducted laboratory sessions for a class of 120
 - Prepared, administered and graded examinations, laboratory assignments and reports
 - Organized tutorial discussions on related courses for a class of 120
 - Counseled students experiencing difficulties in the course

PROFESSIONAL TRAINING

- Critical State Soil Mechanics by Mike Jefferies and Dawn Shuttle, 6-8 February 2020
- Drilling 101 by BGC Engineering Inc., 5 February 2020
- APEGA (Alberta) Engineer-In-Training (Certificate No. EIT 219734)
- University of Alberta Graduate Teaching and Learning Program: 15 hours of pedagogical training
- Learning from Earthquakes Travel Study Program to Chile, January 14-18, 2017, organized by Earthquake Engineering Research Institute (EERI), CA, USA. 2017
- One-day short course and hands-on training on geotechnical drilling, sampling and cone penetration testing, offered by CONETEC. February 2007

- Post extreme event reconnaissance short course and workshop (8-hour) on the collection, processing, integration, and analysis of geospatial earthquake damage data, training organized by Earthquake Engineering Research Institute (EERI), CA, USA. 2017
- Short course on the seismic design of reinforced soil structure (8 hours) followed by a one-day field trip, directed by Prof. Junichi Koseki. September 2011

AWARDS/GRANTS/SCHOLARSHIPS

- Nominated for Governor General's Gold Medal (for outstanding scholastic achievements of students in Canada) from Department of Civil and Environmental Engineering 2019
- Travel grant to attend GEESD V Conference, Austin, TX, USA (\$2000) 2018
- Grant to attend Geo-Ottawa 2017, Ottawa, ON, Canada (\$1500) 2018
- GSA Academic Travel Award to attend Geo-Hazard 7(\$500) 2018
- NSERC IPS2 Scholarship for PhD at University of Alberta (\$21000/year) 2016 - 2017
- FGSR travel grant for graduate student (\$2000) 2017
- Travel grant to attend EERI 69th Annual Meeting, OR, USA (USD \$1000) 2017
- GSA Academic Travel Award (\$500) 2017
- Travel grant from Japan Society for the Promotion of Science (JSPS) for reconnaissance study after 2015 Gorkha, Nepal earthquake (\$3000) 2015
- Travel grant to attend Third GEOMATE 2013, Nagoya, Japan (\$3000) 2013
- Travel grant to attend the 5th Taiwan-Japan Joint Workshop on Geotechnical Hazards from Large Earthquakes and Heavy Rainfalls (\$2500) 2012
- Asian Development Bank (ADB-JSP) fellowship to pursue MSc at the University of Tokyo, Japan (\$30,000 /year). 2010-2012
- "Excellent presentation award" From Japanese Society of Civil Engineers (JSCE) in recognition for having distinguishly presented the research results in highly comprehensible way during the 67th Annual Conference Japan Society of Civil Engineers (JSCE), 5-6 September, 2012, Nagoya, Japan 2012
- Travel grant from University of Tokyo to attend 65th Annual Conference Japan Society of Civil Engineers (JSCE), Kyoto, Japan (\$2000) 2011
- University Regular fellowship for bachelor's degree in civil engineering at Institute of Engineering, Pulchowk Campus, Nepal 2003-2007

TECHNICAL PRESENTATIONS

- Invited presentation on Geotechnical Aspect of 2015 Gorkha, Nepal earthquake. Organized by Department of Civil Engineering, Institute of Engineering, 14/08/2018
- Invited presentation on Rocking Shallow Foundation: An Innovative Foundation Design Concept. Organized by Nepal Geotechnical Society, Nepal, 16/08/2018
- Rocking shallow foundations in earthquake zone: field snap-back testing in cohesive soil. Geohazards 7, Canmore, AB, Canada, 05/06/2018

- Rocking foundation on a natural clay subjected to lateral cyclic loads. Geotechnical earthquake engineering and soil dynamics conference, Austin, TX, USA, 06/12/2018
- Field Investigation of Rocking Shallow Foundations on a Natural Soil Deposits, Proc. of Geo-Ottawa 2017, Ottawa, Canada. 10/04/2018
- Field Investigation of Cyclic Behavior of Rocking Shallow Foundations. 69th EERI Annual Meeting, Portland, OR, USA, 09/03/2017
- Influence of cyclic wetting and drying on the mechanical properties of crushed mudstones under constant stress condition; 3rd Int. Conference on Geotechnique, Construction Materials and Environment GEOMATE Nagoya, Japan, 11/14/2013
- Influence of cyclic wetting and drying on stress and deformation characteristics of crushed mudstones in direct shear test; 5th Taiwan-Japan Joint Workshop on Geotechnical Hazards from Large Earthquakes and Heavy Rainfalls, Taiwan, 11/12/2012
- Cyclic wetting and drying induced creep deformation of crushed mudstone in direct shear test; 14th International Summer Symposium in conjunction with JSCE 67th Annual Conference Japan Society of Civil Engineers (JSCE), Nagoya, Japan, 09/06/2012
- Slaking effect on shear deformation and creep deformation of mudstone; 13th international summer symposium, Japan Society of Civil Engineers (JSCE), Kyoto, Japan, 08/26/2011

PROFESSION EXPERIENCE

1. Geotechnical Engineer (June 2019- till)

BGC Engineering Inc., Fredericton, NB, Canada

- Supervise and conduct advanced soil and rock testing including shear test (cyclic, dynamic, direct and simple shear), servo-controlled fully-automated triaxial (UCS, CU, UU, CD, and K test etc.), automated odometer systems (Incremental loading, creep loading, and constant rate consolidation), large scale direct shear test (Direct shear test on course materials, Geosynthetic clay liner testing etc.)
- Analysis of soil liquefaction, Modelling of Critical State Soil Mechanic (CSSM)
- Manage the BGC's advanced laboratory, coordinate with clients and other BGC offices
- Analyses the test results and prepare the reports

2. Engineer (January 2013 - December 2013)

Save the Children International, Kathmandu, Nepal

- Inspect facilities and equipment in the local emergency management centers to determine their operational and functional capabilities in emergency situations.
- Design and implement disaster preparedness training courses that teach teachers and local leaders how to effectively respond to major emergencies and disasters.

- Consult with local governments, schools, hospitals, and other institutions in order to determine their needs and capabilities in the event of a natural disaster or other emergency.

3. Civil Engineer (January 2008 – September 2010)

- Development of CAD drawings from concept to final design, drawn to scale in appropriate layout with suitable notation and symbols
- Preparation of commercial and residential building drawing for municipality approval and revision base on the comments from authorities.
- Preparation of detail working drawing for architectural, structural, electrical, and sanitary component of the building.
- Design drawing of site development plan, access road, water supply system, water reservoir tank, culverts, drainage, retaining structure and bio engineering measures
- Validating the design drawings to conform as per specifications and design data
- Inspection, quality assurance in line with established code and practice
- Review data to determine material and labor requirements and prepare an itemized list.

AFFILIATIONS

- Canadian Geotechnical Society, Canada
- Canadian Association of Earthquake Engineering (CAEE)
- Earthquake Engineering Research Institute (EERI)
- Geotechnical Extreme Events Reconnaissance (GEER) Association
- Registered Engineer (5639, Civil, A Category): Nepal Engineering Council
- Nepal Engineers' Association, Nepal
- American Society of Civil Engineers (ASCE): student member

SERVICES

- Peer reviewer: ASCE Journal of Geotechnical & Geoenvironmental Engineering (2); International Journal of Geotechnical Engineering (7); Journal of Earthquake Engineering (3); International Journal of Physical Modelling in Geotechnics (2); Earthquake Engineering and Engineering Vibration (1); Structures (2); Journal of Mountain Science (3); Third International Conference on Geotechnique, Construction Materials and Environment, Nagoya, Japan (3); ASCE 2019 Geo-Congress (3); PBD III, Vancouver 2017 (3)
- Op-ed writer/Columnist on socio-technical issues for Nepali National Newspaper
- President, Nepal Student Union, Pulchowk Campus, 2006
- Coordinator- Arts and Craft section, Nepal Heritage Festival Pavilion, Edmonton Heritage Festival (2015-2017).

COMPUTER PROFICIENCY

- Dynamic analysis: OpenSEES
- Structural analysis: SAP 2000
- Geotechnical programs and constitutive model: SHAKE, DeepSoil, SLOPE/W, SEEP/W, Examine, S/Wedge, NorSand
- Scientific and engineering: AutoCAD, MathCAD, Matlab, Grapher, OriginLab