

**SAFER Project (EP/P028926/1)
WP1**

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and
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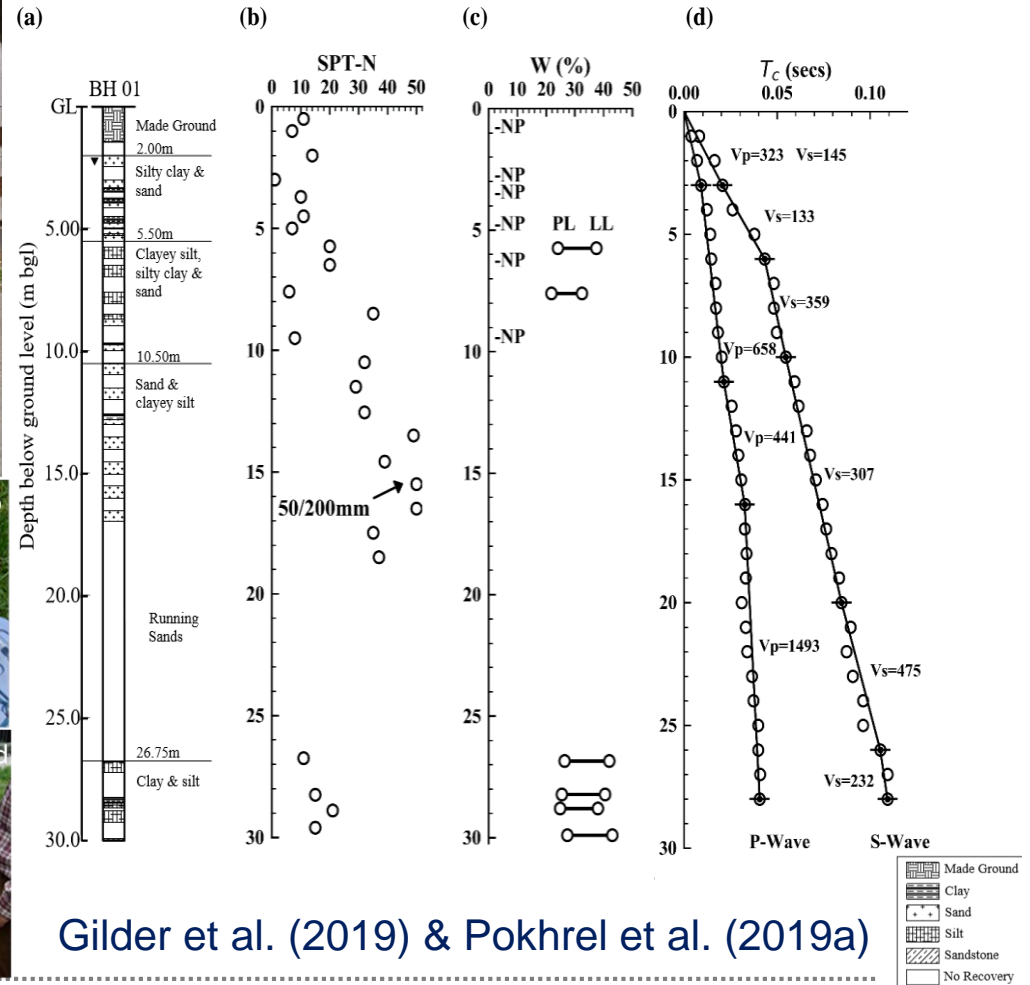
WP1 - deliverables

- Harmonized geo-database of site investigation data for Kathmandu Valley (KV)
- SAFER geotechnical investigation campaign
- V_{S30} map (based on Bayesian kriging) for KV to be included in SAFER app

Ongoing

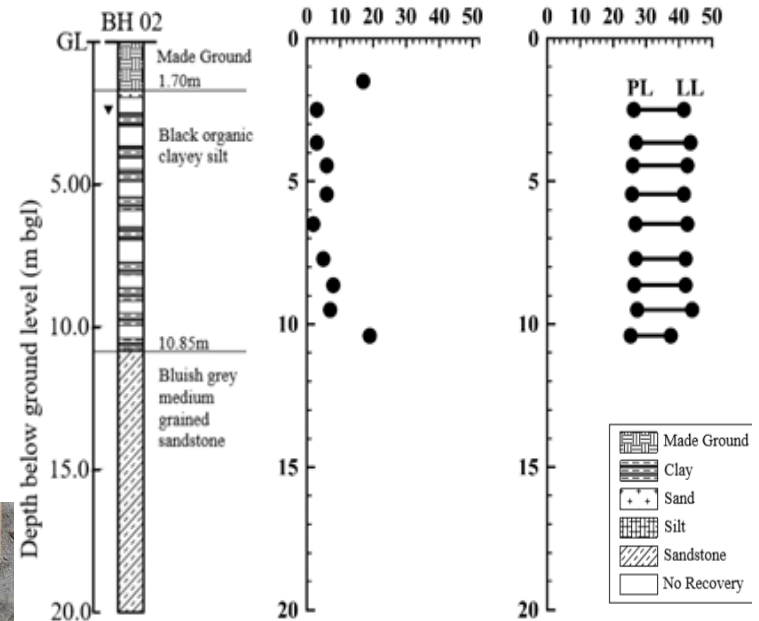
- Simulation-based PSHA building upon Stevens et al. (2018) seismic zones
- Physics-based wave simulation through SPEED using updated geological basin model

Site investigation at the BH-1



Gilder et al. (2019) & Pokhrel et al. (2019a)

Site investigation at BH-2

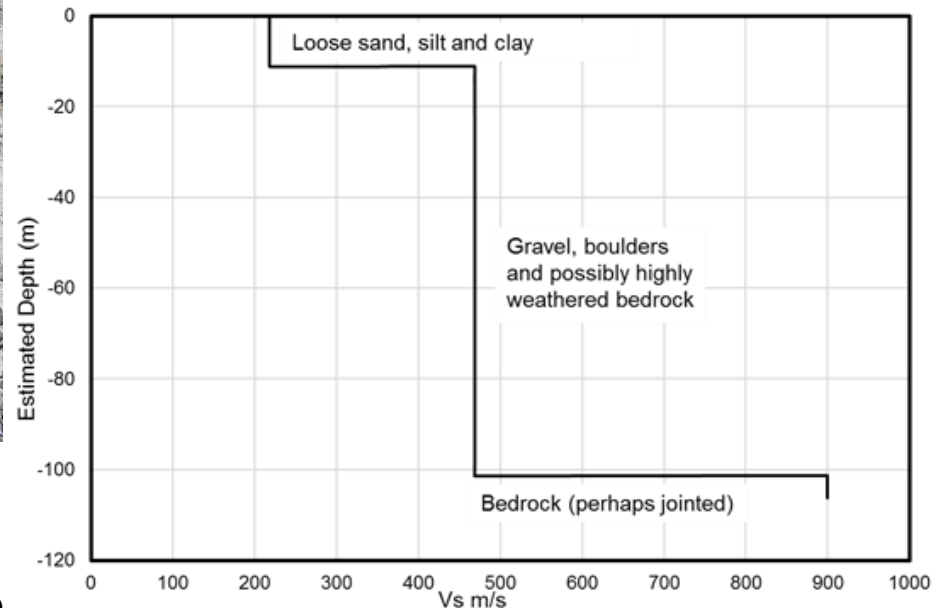


Gilder et al. (2019) &
 Pokhrel et al. (2019a)

Geophysical Test for BH-2



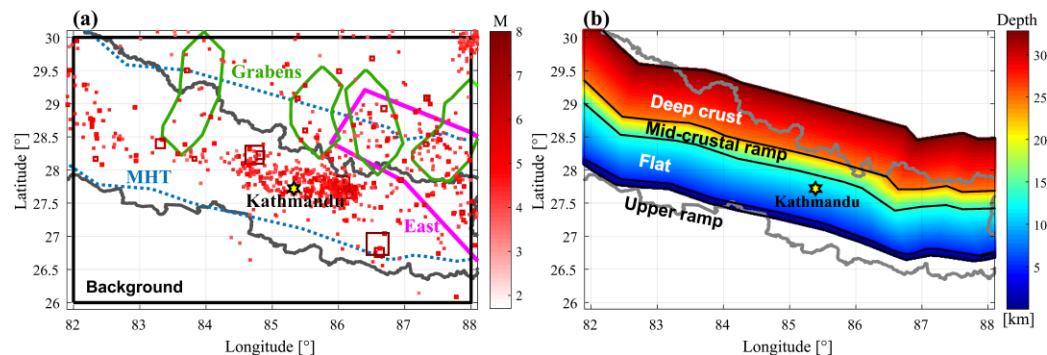
Horizontal to Vertical Spectral Ratio (HVSr) method was used in this BH-2, the graph shows loose soil at the surface and possible bed rock at the depth of 101.5m from the surface.



Pokhrel et al. (2019a)

Ongoing work: Simulation-based PSHA

- We are investigating the sensitivity of PSHA estimates to different modelling choices (source and ground motion models).
- Purpose: to inform ongoing discussions around an update of the national seismic hazard map.
- Advantage: We use a simulation-based approach that can easily be used for engineering applications.
- Past studies e.g., Ram and Wang (2013)
- More recent study Stevens et al. (2018)



Pokhrel et al. (2019b)

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Ongoing

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References

- Gilder, C. E. L., Pokhrel, R. M. and Vardanega, P. J. (2019). A ground investigation to inform earthquake hazard assessment in the Kathmandu Valley, Nepal. *Paper to be presented at XVII ECSMGE-2019* (September 2019).
- Pokhrel, R. M., Gilder, C. E. L., Vardanega, P. J., De Luca, F., Werner, M. J. and Maskey, P. N. (2019a). Estimation of V_{S30} by the HSVR method at a Site in the Kathmandu Valley, Nepal. *Proceedings 2nd International Conference on Earthquake Engineering and Post Disaster Reconstruction Planning, 25 – 27 April, 2019, Bhaktapur, Nepal*, pp. 52-60.
- Pokhrel, R. M., De Risi, R., Werner, M. J., De Luca, F., Vardanega, P. J., Maksey, P. N. and Sextos, A. (2019b). Simulation-based PSHA for the Kathmandu Basin in Nepal. *Paper to be presented at the 13th International Conference on Applications of Statistics and Probability in Civil Engineering ICASP13, Seoul, South Korea* (May 2019).
- Stevens, V. L., Shrestha, S. N. and Maharjan, D. K. (2018). Probabilistic Seismic Hazard Assessment of Nepal. *Bulletin of the Seismological Society of America*, **108(6)**: 3488–3510, <https://doi.org/10.1785/0120180022>
- Ram, T. D. and Wang, G. (2013) Probabilistic seismic hazard analysis in Nepal. *Earthquake Engineering and Engineering Vibration*, **12(4)**: 577-586, <https://doi.org/10.1007/s11803-013-0191-z>