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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Abella, E. C., & Van Westen, C. J. (2007). Generation of a Landslide Risk Index Map for Cuba Using Spatial Multi-Criteria Evaluation. *Landslides*, *4*(4), 311–325. https://doi.org/10.1007/s10346-007-0087-y

Afak, E. (2001). Local Site Effects and Dynamic Soil Behavior. *Soil Dynamics and Earthquake Engineering*, *21*(5), 453–458. https://doi.org/10.1016/S0267-7261(01)00021-5

Allstadt, K. E., Thompson, E. M., Jibson, R. W., Wald, D. J., Hearne, M., Hunter, E. J., ... & Haynie, K. L. (2022). The US Geological Survey Ground Failure Product: Near-Real-Time Estimates of Earthquake-Triggered Landslides and Liquefaction. *Earthquake Spectra*, *38*(1), 5–36. https://doi.org/10.1177/87552930211032684

Annisa, N., Adhiany, R., Suci, L., Apsari, N., Prifahika, P., Lakista, M., & Majid, Z. (2025). Analisis Daya Dukung Permukiman Imogiri, Bantul. *Tech: Journal of Engineering Science*, *1*(2), 143–158. https://doi.org/10.5281/zenodo.14516315

Badan Nasional Penanggulangan Bencana. (2024). Data Informasi Bencana Indonesia. Dalam *Pusat Data Informasi dan Humas-BNPB*. http://dibi.bnpb.go.id/

Badan Penanggulangan Bencana Daerah. (2024). *Data Kejadian Bencana Daerah Istimewa Yogyakarta*. https://pamor.jogjaprov.go.id/

Badan Pusat Statistik. (2024). *Jumlah Desa/Kelurahan yang Mengalami Bencana Alam Menurut Kecamatan di Kabupaten Bantul Tahun 2019–2021*. Badan Pusat Statistik Kabupaten Bantul.

Badan Pusat Statistik. (2025). *Kecamatan Imogiri dalam Angka 2025*. Badan Pusat Statistik Kabupaten Bantul.

Bemmelen, R. W. van. (1949). *The Geology of Indonesia: General Geology of Indonesia and Adjacent Archipelagoes* (Vol. 1A). US Government Printing Office.

Bobrowsky, P. T. (Ed.). (2013). *Encyclopedia of Natural Hazards*. Springer Science & Business Media. https://doi.org/10.1007/978-1-4020-4399-4

Bolt, B. A. (2005). *Earthquakes* (5th ed.). W. H. Freeman & Co.

Brahmantyo, B., & Salim, B. (2006). Klasifikasi Bentuk Muka Bumi (Landform) untuk Pemetaan Geomorfologi pada Skala 1: 25.000 dan Aplikasinya untuk Penataan Ruang. *Jurnal Geoaplika*, *1*(2), 71–79.

Britannica, T. Editors of Encyclopaedia. (n.d.). *Gal*. In *Encyclopaedia Britannica*. Retrieved June 3, 2026, from Encyclopaedia Britannica - Gal

Bulo, D., Djayus, D., & Supriyanto, S. (2020). Penentuan Titik Epicenter dan Hypocenter serta Parameter Magnitude Gempabumi Berdasarkan Data Seismogram. *Geosains Kutai Basin*, *3*(1), 19–24.

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Chaidir, N., Hindersah, H., & Rustidja, E. S. (2024). Pemetaan Multi Risiko Bencana bagi Perencanaan Penyediaan Infrastruktur Mitigasi di Kawasan Amfiteater Geopark Ciletuh-Palabuhanratu. *Urban and Regional Studies Journal*, *6*(2), 243–253. https://doi.org/10.35965/ursj.v6i2.3982

Chouet, B. A. (1996). Long-Period Volcano Seismicity: Its Source and Use in Eruption Forecasting. *Nature*, *380*(6572), 309–316. https://doi.org/10.1038/380309a0

Cooke, R. V., & Doornkamp, J. C. (1990). *Geomorphology in Environmental Management: A New Introduction*. Oxford University Press.

Crosta, G. B., & Agliardi, F. (2003). A Methodology for Physically Based Rockfall Hazard Assessment. *Natural Hazards and Earth System Sciences*, *3*(3), 407–422. https://doi.org/10.5194/nhess-3-407-2003

Crozier, M. J. (1992). Determination of Palaeoseismicity from Landslides. In *International Symposium on Landslides* (pp. 1173–1180).

Crozier, M. J., & Glade, T. (Eds.). (2005). *Landslide Hazard and Risk*. John Wiley & Sons. https://doi.org/10.1002/9780470012659

Cruden, D. M. (1996). Landslide Types and Processes. *Transportation Research Board, US National Academy of Sciences, Special Report*, *247*, 36–75.

Dadson, S. J., Hovius, N., Chen, H., Dade, W. B., Lin, J. C., Hsu, M. L., ... & Stark, C. P. (2004). Earthquake-Triggered Increase in Sediment Delivery from an Active Mountain Belt. *Geology*, *32*(8), 733–736. https://doi.org/10.1130/G20639.1

Demek, J., & Embleton, C. (1978). *Guide to Medium-Scale Geomorphological Mapping*. E. Schweizerbart'sche Verlagsbuchhandlung.

Dibyosaputro, S., & Haryono, E. (2020). *Geomorfologi Dasar*. UGM PRESS.

Dinas Kependudukan dan Pencatatan Sipil Kabupaten Bantul. (2025). *Data Agregat Kependudukan Kabupaten Bantul Semester I*. Disdukcapil Kabupaten Bantul.

Dodds, W. K., & Smith, V. H. (2016). Nitrogen, Phosphorus, and Eutrophication in Streams. *Inland Waters*, *6*(2), 155–164. https://doi.org/10.5268/IW-6.2.909

Dorren, L. K. (2003). A Review of Rockfall Mechanics and Modelling Approaches. *Progress in Physical Geography*, *27*(1), 69–87. https://doi.org/10.1191/0309133303pp359ra

Douglas, J. (2003). Earthquake Ground Motion Estimation Using Strong-Motion Records: A Review of Equations for the Estimation of Peak Ground Acceleration and Response Spectral Ordinates. *Earth-Science Reviews*, *61*(1-2), 43–104. https://doi.org/10.1016/S0012-8252(02)00112-5

Duan, Y., Luo, J., Pei, X., & Liu, Z. (2023). Co-Seismic Landslides Triggered by the 2014 Mw 6.2 Ludian earthquake, Yunnan, China: Spatial distribution,

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Directional Effect, and Controlling Factors. *Remote Sensing*, *15*(18), 4444. https://doi.org/10.3390/rs15184444

Dunant, A., Robinson, T. R., Densmore, A. L., Rosser, N. J., Rajbhandari, R. M., Kincey, M., ... & Dadson, S. (2025). Impacts from Cascading Multi-Hazards Using Hypergraphs: A Case Study from the 2015 Gorkha Earthquake in Nepal. *Natural Hazards and Earth System Sciences*, *25*(1), 267–285. https://doi.org/10.5194/nhess-25-267-2025

Eastman, J. R. (1999). Multi-Criteria Evaluation and GIS. *Geographical Information Systems*, *1*(1), 493–502.

El Fahchouch, A. N. E., Brahim, L. A., Mastere, M., & Abdelouafi, A. (2010). Landslide Susceptibility Assessment by Weight of Evidence (WOE) in the Beni Ahmed Area (Rif, Morocco). *GeoCanada 2010 – Working with the Earth*.

Fatiatun, F., Firdaus, F., Jumini, S., & Adi, N. P. (2019). Analisis Bencana Tanah Longsor serta Mitigasinya. *SPEKTRA: Jurnal Kajian Pendidikan Sains*, *5*(2), 134–139.

Ford, D., & Williams, P. D. (2007). *Karst Hydrogeology and Geomorphology*. John Wiley & Sons. https://doi.org/10.1002/9781118684986

Fukushima, Y., & Tanaka, T. (1990). A New Attenuation Relation for Peak Horizontal Acceleration of Strong Earthquake Ground Motion in Japan. *Bulletin of the Seismological Society of America*, *80*(4), 757–783. https://doi.org/10.1785/BSSA0800040757

Ghofur, M. A., Sukarasa, I. K., & Darsono, R. (2022). Pemetaan Tingkat Bahaya Bencana Gempabumi di Wilayah Banyuwangi Berdasarkan Percepatan Tanah Maksimum. *Buletin Fisika*, *23*(1), 43–50. https://doi.org/10.24843/bf.2022.v23.i01.p06

Gorum, T., Fan, X., van Westen, C. J., Huang, R. Q., Xu, Q., Tang, C., & Wang, G. (2011). Distribution Pattern of Earthquake-Induced Landslides Triggered by the 12 May 2008 Wenchuan Earthquake. *Geomorphology*, *133*(3-4), 152–167. https://doi.org/10.1016/j.geomorph.2010.12.030

Gunawan, A., & Khadiyanto, P. (2012). Kajian Aspek Bentuk Lahan dan Geologi Berdasarkan Mikrotremor dalam Perencanaan Ruang Kawasan Rawan Gempa di Kabupaten Bantul Daerah Istimewa Yogyakarta (Studi Kasus: Kecamatan Bantul, Jetis, Imogiri, dan Kretek). *Jurnal Pembangunan Wilayah dan Kota*, *8*(2), 178–190. https://doi.org/10.14710/pwk.v8i2.11570

Gustavsson, M., Kolstrup, E., & Seijmonsbergen, A. C. (2006). A New Symbol-and-GIS Based Detailed Geomorphological Mapping System: Renewal of a Scientific Discipline for Understanding Landscape Development. *Geomorphology*, *77*(1-2), 90–111.https://doi.org/10.1016/j.geomorph.2006.01.026

Hadmoko, D. S., Lavigne, F., & Samodra, G. (2017). Application of a Semiquantitative and GIS-Based Statistical Model to Landslide Susceptibility Zonation in Kayangan Catchment, Java, Indonesia. *Natural Hazards*, *87*(1), 437–468. https://doi.org/10.1007/s11069-017-2772-z

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Hadmoko, D. S., Wibowo, S. B., Sianipar, D. S. J., Daryono, D., Fathoni, M. N., Pratiwi, R. S., ... & Lavigne, F. (2024). Co-Seismic Deformation and Related Hazards Associated with the 2022 Mw 5.6 Cianjur Earthquake in West Java, Indonesia: Insights from Combined Seismological Analysis, DInSAR, and Geomorphological Investigations. *Geoenvironmental Disasters*, *11*(1), 15. https://doi.org/10.1007/s11069-017-2772-z

Harith, N. S. H., Tongkul, F., & Adnan, A. (2023). Seismic Hazard Curve as Dynamic Parameters in Earthquake Building Design for Sabah, Malaysia. *Buildings*, *13*(2), 318. https://doi.org/10.3390/buildings13020318

He, Y., Nie, L., Lv, Y., Wang, H., Jiang, S., & Zhao, X. (2021). The Study of Rockfall Trajectory and Kinetic Energy Distribution Based on Numerical Simulations. *Natural Hazards*, *106*(1), 213–233. https://doi.org/10.1007/s11069-020-04457-z

Hermon, D. (2015). *Geografi Bencana Alam*. PT. RajaGrafindo Persada - Rajawali Pers.

Hizbaron, D. R., Sudibyakto, H. A., & Ayuningtyas, E. A. (2021). *Kajian Kapasitas Masyarakat Lembaga Pemerintah dan Swasta dalam Upaya Pengurangan Risiko Bencana di Yogyakarta*. UGM PRESS.

Huang, Y., & Yu, M. (2017). *Hazard Analysis of Seismic Soil Liquefaction*. Springer.

Huggett, R. J. (2007). *Fundamentals of Geomorphology*. Routledge.

Huggett, R. J. (2011). *Fundamentals of Geomorphology* (3rd ed.). Routledge.

Ichii, K., Hayashi, Y., Koyama, T., & Takahashi, T. (2019). Natural Disasters. In S. Abe, M. Ozawa, & Y. Kawata (Eds.), *Science of Societal Safety: Interdisciplinary Perspectives* (Vol. 2, pp. 63–74). Springer. https://doi.org/10.1007/978-981-13-2775-9_6

Idriss, I. M., & Boulanger, R. W. (2008). *Soil Liquefaction During Earthquakes*. Earthquake Engineering Research Institute (EERI).

Irawan, L. Y., Panoto, D., Febrianto, A. D., Azizah, V., Farihah, S. N., Aufaristama, M., & Mapa, M. T. (2024). Multi-Hazard Detection in the Southern Part of Banyuwangi Regency Using a Geomorphological Approach. *Jàmbá: Journal of Disaster Risk Studies*, *16*(1), 1–11.https://doi.org/10.4102/jamba.v16i1.1586

Irsyam, M., Sengara, W., Aldiamar, F., Widiyantoro, S., Triyoso, W., Natawidjaja, D. H., ... & Ridwan, M. (2010). *Hasil Studi Tim Revisi Peta Gempa Indonesia 2010*. Tim Revisi Gempa Indonesia.

Jefferies, M., & Been, K. (2015). *Soil Liquefaction: A Critical State Approach* (2nd ed.). CRC Press. https://doi.org/10.1201/b19114

Jibson, R. W. (2007). Regression Models for Estimating Coseismic Landslide Displacement. *Engineering Geology*, *91*(2-4), 209–218. https://doi.org/10.1016/j.enggeo.2007.01.013

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Kappes, M. S., Keiler, M., Von Elverfeldt, K., & Glade, T. (2012). Challenges of Analyzing Multi-Hazard Risk: A Review. *Natural Hazards*, *64*(2), 1925–1958. https://doi.org/10.1007/s11069-012-0294-2

Keefer, D. K. (1984a). Landslides Caused by Earthquakes. *Geological Society of America Bulletin*, *95*(4), 406–421. https://doi.org/10.1130/0016-7606(1984)95<406:LCBE>2.0.CO;2

Keefer, D. K. (1984b). Rock Avalanches Caused by Earthquakes: Source Characteristics. *Science*, *223*(4642), 1288–1290. https://doi.org/10.1126/science.223.4642.1288

Keller, E. A., & Pinter, N. (2002). *Active Tectonics: Earthquakes, Uplift, and Landscape* (2nd ed.). Prentice Hall.

Kementerian Pekerjaan Umum. (2007). *Peraturan Menteri Pekerjaan Umum No. 21/PRT/M/2007: Pedoman Penataan Ruang Kawasan Rawan Letusan Gunung Berapi dan Kawasan Rawan Gempa Bumi*. Departemen Pekerjaan Umum Direktorat Jenderal Penataan Ruang.

Kementerian Pekerjaan Umum. (2010). *Spesifikasi Umum Perkerasan Aspal Revisi 3*. Kementerian Pekerjaan Umum Direktorat Jenderal Bina Marga.

Kumar, S., & Sengupta, A. (2024). Application of ML-Based Approach for Co-Seismic Landslides Susceptibility Mapping and Identification of Important Controlling Factors in Eastern Himalayan Region. *Environmental Earth Sciences*, *83*(21), 603.https://doi.org/10.1007/s12665-024-11911-9

Lanfranconi, C., Frattini, P., Sala, G., Dattola, G., Bertolo, D., Sun, J., & Crosta, G. B. (2023). Accounting for the Effect of Forest and Fragmentation in Probabilistic Rockfall Hazard. *Natural Hazards and Earth System Sciences*, *23*(6), 2349–2363. https://doi.org/10.5194/nhess-23-2349-2023

Lay, T., & Wallace, T. C. (1995). *Modern Global Seismology*. Elsevier.

Lee, E. M. (2001). Geomorphological Mapping. In J. S. Griffiths (Ed.), *Land Surface Evaluation for Engineering Practice* (Geological Society Engineering Geology Special Publication Vol. 18, pp. 53–56). Geological Society of London. https://doi.org/10.1144/GSL.ENG.2001.018.01.08

Li, W. L., Huang, R. Q., Tang, C., Xu, Q., & van Westen, C. (2013). Co-Seismic Landslide Inventory and Susceptibility Mapping in the 2008 Wenchuan Earthquake Disaster Area, China. *Journal of Mountain Science*, *10*(3), 339–354. https://doi.org/10.1007/s11629-013-2471-5

Lobeck, A. K. (1939). *Geomorphology: An Introduction to the Study of Landscapes*. McGraw-Hill Book Company.

Maheshwari, S., Bhowmik, R., & Samanta, M. (2025). Mechanics and Modelling Approaches of Rockfall: A Comprehensive Review for Hazard Mitigation in Hill Roads. *Arabian Journal of Geosciences*, *18*(2), 1–28. https://doi.org/10.1007/s12517-025-12189-2

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Marsell, R. (2013). Zonasi Daerah Rawan Gempa Bumi di Kecamatan Pundong, Bantul Berdasarkan Pendekatan Geomorfologi. *Majalah Geografi Indonesia*, *27*(1), 11-25. https://doi.org/10.22146/mgi.13439

Mardiatno, D., Susmayadi, I. M., Faizah, M., Mustofa, U., & Ahmad, D. N. A. (2022). Multi-hazards analysis based on landscape approach in the area of Yogyakarta new airport site plan. Proceedings paper, 122–131.

Marsyelina, M., Wibowo, N. B., & Darmawan, D. (2014). Karakteristik Mikrotremor dan Analisis Seismisitas pada Jalur Sesar Opak, Kabupaten Bantul, Yogyakarta. *Jurnal Sains Dasar*, *3*(1), 95–101.

Mase, L. Z. (2019). The Empirical Analysis of Soil Liquefaction in Imogiri Site, Yogyakarta, Indonesia. *Potensi: Jurnal Sipil Politeknik*, *21*(1), 37–41. https://doi.org/10.35313/potensi.v21i1.1315

McKenzie, D. P., & Parker, R. L. (1967). The North Pacific: An Example of Tectonics on a Sphere. *Nature*, *216*(5122), 1276–1280. https://doi.org/10.1038/2161276a0

Meunier, P., Hovius, N., & Haines, J. A. (2008). Topographic Site Effects and the Location of Earthquake Induced Landslides. *Earth and Planetary Science Letters*, *275*(3-4), 221–232. https://doi.org/10.1016/j.epsl.2008.07.020

Moody, J. A. (2019). Dynamic Relations for the Deposition of Sediment on Floodplains and Point Bars of a Freely-Meandering River. *Geomorphology*, *327*, 585–597. https://doi.org/10.1016/j.geomorph.2018.11.032

Murphy, B. (2015). Coseismic Landslides. In *Landslide Hazards, Risks, and Disasters* (pp. 91–129). Academic Press. https://doi.org/10.1016/B978-0-12-396452-6.00004-5

Murphy, J. R. (1979). The Correlation of Peak Ground Acceleration Amplitude with Seismic Intensity and Other Physical Parameters. *Bulletin of the Seismological Society of America*, *69*(3), 815–827. https://doi.org/10.1785/BSSA0670030877

Murtianto, H. (2016). Potensi Kerusakan Gempa Bumi Akibat Pergerakan Patahan Sumatera di Sumatera Barat dan Sekitarnya. *Jurnal Geografi Gea*, *10*(1). https://doi.org/10.17509/gea.v10i1.1667

Muta'ali, L. (2015). *Teknik Analisis Regional untuk Perencanaan Wilayah, Tata Ruang dan Lingkungan*. Badan Penerbit Fakultas Geografi UGM.

Nasrullah. (2017). Geologi Daerah Selopamioro dan Sekitarnya Kecamatan Imogiri Kabupaten Bantul Daerah Istimewa Yogyakarta. *Jurnal Online Mahasiswa (JOM) Bidang Teknik Geologi, Universitas Pakuan*.

Natawidjaja, D. H., & Triyoso, W. (2007). The Sumatran Fault Zone—From Source to Hazard. *Journal of Earthquake and Tsunami*, *1*(01), 21–47. https://doi.org/10.1142/S1793431107000031

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Ningsih, R. L., Wulan, P. Y. N., Haq, A. H., Ihsan, F. N., Kusuma, R. W., Farhan, R., ... & Haryono, E. (2023). Multi-Hazard Susceptibility Analysis of Bantul Regency. *Jurnal Geografi Gea*, *23*(1), 8–18. https://ejournal.upi.edu/index.php/gea

Nurhaci, D. S. (2024). Analysis of liquefaction potential using the analytical hierarchy process method in Bantul District, Yogyakarta Province, Indonesia. *Kurvatek*, *9*(2), 197–206. https://doi.org/10.33579/krvtk.v9i2.5409

Owen, G., & Moretti, M. (2011). Identifying Triggers for Liquefaction-Induced Soft-Sediment Deformation in Sands. *Sedimentary Geology*, *235*(3-4), 141–147. https://doi.org/10.1016/j.sedgeo.2010.10.003

Palys, T. (2008). Purposive Sampling. *The Sage Encyclopedia of Qualitative Research Methods*, *2*(1), 697–698.

Parise, M., & Jibson, R. W. (2000). A Seismic Landslide Susceptibility Rating of Geologic Units Based on Analysis of Characteristics of Landslides Triggered by the 17 January, 1994 Northridge, California Earthquake. *Engineering Geology*, *58*(3-4), 251–270. https://doi.org/10.1016/S0013-7952(00)00038-7

Pasambo, N., Patandianan, E. A., & Mayzarah, E. M. (2025). Karakteristik Kondisi Geologi di Kelurahan Ransiki, Kabupaten Manokwari Selatan, Provinsi Papua Barat terhadap Potensi Bahaya Likuifaksi. *Jurnal Geosains dan Remote Sensing*, *6*(2), 99–112. https://doi.org/10.23960/jgrs.ft.unila.534

Pawirodikromo, W. (2018). The Estimated PGA Map of the Mw6.4 2006 Yogyakarta Indonesia Earthquake, Constructed from the Modified Mercalli Intensity IMM. *Bulletin of the New Zealand Society for Earthquake Engineering*, *51*(2), 92–104. https://doi.org/10.5459/bnzsee.51.2.92-104

Pourghasemi, H. R., Pradhan, B., Gokceoglu, C., & Deylami Moezzi, K. (2012). Landslide Susceptibility Mapping Using a Spatial Multi Criteria Evaluation Model at Haraz Watershed, Iran. In *Terrigenous Mass Movements* (pp. 23–49). Springer. https://doi.org/10.1007/978-3-642-25495-6_2

Prasetyadi, C., Sudarno, I., Indranadi, V. B., & Surono, S. (2011). Pola dan Genesa Struktur Geologi Pegunungan Selatan, Provinsi Daerah Istimewa Yogyakarta dan Provinsi Jawa Tengah. *Jurnal Geologi dan Sumberdaya Mineral*, *21*(2), 91–107. https://doi.org/10.33332/jgsm.geologi.v21i2.138

Prayudi, S. D., Hutama, R. D., Zakiya, A., Putranto, T. T., & Trisnawati, D. (2019). Pengaplikasian Olah Data Penginderaan Jauh, Pendekatan dan Permodelan Geologi dalam Kajian Bencana Likuifaksi di Wilayah Kabupaten Sigi, Provinsi Sulawesi Tengah. In *Prosiding TAU SNARS-TEK Seminar Nasional Rekayasa dan Teknologi* (Vol. 1, No. 1, pp. 166–172).

Pudi, R., Martha, T. R., Roy, P., Kumar, K. V., & Rao, P. R. (2019). Regional Liquefaction Susceptibility Mapping in the Himalayas Using Geospatial Data and AHP Technique. *Current Science*, *116*(11), 1868–1877. https://doi.org/10.18520/cs/v116/i11/1868-1877

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Rahardjo, W., Sukandarrumidi, & Rosidi, H. M. D. (1995). *Peta Geologi Lembar Yogyakarta, Jawa* (Skala 1:100.000). Pusat Penelitian dan Pengembangan Geologi.

Rahma, A. D., & Mardiatno, D. (2018). Potensi Kerawanan Bencana Banjir dan Longsor Berbasis Karakteristik Geomorfologi di Sub-Das Gelis, Keling, Jepara. *Majalah Ilmiah Globe*, *20*(1), 23–34.

Rais, L. N. (2021). Analisis Bencana Gempa Bumi dan Mitigasi Bencana di Daerah Kertasari. *Jurnal Samudra Geografi*, *4*(2), 14–19. https://doi.org/10.33059/jsg.v4i2.3773

Ramdhan, M., Priyobudi, P., Mukti, M. M., Putra, A. S., Hidayat, E., Muttaqy, F., Syuhada, S., Hanif, M., Widiyantoro, S., Librian, V., Susilawati, A., Madrinovella, I., & Wandono, W. (2026). Tracing Fault Systems From Subsurface to Surface in Yogyakarta and Its Surroundings, Indonesia. *Natural Hazards Research*, *6*(1), 237–250. https://doi.org/10.1016/j.nhres.2025.07.003

Rizqi, A. H. F., Putra, F. E., Widianto, F., Erlandi, M., Ahmad, G. A., Tuska, R. T., & Ogara, E. R. (2026). Fault control on distribution of sag-ponds in Imogiri, Bantul, Yogyakarta, and its implications for the existence of the Opak active fault. *E3S Web of Conferences*, *688*, Article 01015. https://doi.org/10.1051/e3sconf/202668801015

Saaty, T. L. (1980). *The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation*. McGraw-Hill.

Saaty, T. L., & Vargas, L. G. (2012). *Models, Methods, Concepts & Applications of the Analytic Hierarchy Process* (Vol. 175). Springer Science & Business Media. https://doi.org/10.1007/978-1-4614-3597-6

Safak, E. (2001). Local Site Effects and Dynamic Soil Behavior. *Soil Dynamics and Earthquake Engineering*, *21*(5), 453–458. https://doi.org/10.1016/S0267-7261(01)00021-5

Saputra, A., Gomez, C., Hadmoko, D. S., & Sartohadi, J. (2016). Coseismic Landslide Susceptibility Assessment Using Geographic Information System. *Geoenvironmental Disasters*, *3*(1), 27. https://doi.org/10.1186/s40677-016-0059-4

Saputra, R. T., Utami, S. R., & Agustina, C. (2022). Hubungan Kemiringan Lereng dan Persentase Batuan Permukaan terhadap Longsor Berdasarkan Hasil Simulasi. *JTSL (Jurnal Tanah dan Sumberdaya Lahan)*, *9*(2), 339–346. https://doi.org/10.21776/ub.jtsl.2022.009.2.14

Savigear, R. A. G. (1960). Slopes and Hills in West Africa. *Zeitschrift für Geomorphologie*, *Supplement 1*, 156–171.

Schneiderbauer, S., & Ehrlich, D. (2004). *Risk, Hazard and People's Vulnerability to Natural Hazards: A Review of Definitions, Concepts and Data* (EUR 21410 EN). European Commission Joint Research Centre.

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Scholz, C. H. (2019). *The Mechanics of Earthquakes and Faulting* (3rd ed.). Cambridge University Press. https://doi.org/10.1017/9781316681473

Seed, H. B. (1982). Design Problems in Soil Liquefaction. *Journal of Geotechnical Engineering*, *108*(4), 517–553. https://doi.org/10.1061/(ASCE)0733-9410(1982)108:4(517)

Seed, H. B., & Idriss, I. M. (1971). Simplified Procedure for Evaluating Soil Liquefaction Potential. *Journal of the Soil Mechanics and Foundations Division*, *97*(9), 1249–1273. https://doi.org/10.1061/JSFEAQ.0001662

Segoni, S., Rossi, G., & Catani, F. (2012). Improving Basin Scale Shallow Landslide Modelling Using Reliable Soil Thickness Maps. *Natural Hazards*, *61*(1), 85–101. https://doi.org/10.1007/s11069-011-9770-3

Shearer, P. M. (2019). *Introduction to Seismology* (3rd ed.). Cambridge University Press.

Shirzadi, A., Chapi, K., Shahabi, H., Solaimani, K., Kavian, A., & Ahmad, B. B. (2017). Rock Fall Susceptibility Assessment Along a Mountainous Road: An Evaluation of Bivariate Statistic, Analytical Hierarchy Process and Frequency Ratio. *Environmental Earth Sciences*, *76*(4), 1–17. https://doi.org/10.1007/s12665-017-6471-6

Smith, D. M., Goodchild, M. F., & Longley, P. A. (2007). *Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software Tools* (2nd ed.). Troubador Publishing Ltd.

Smith, M. J., & Pain, C. F. (2011). Geomorphological Mapping. In *The SAGE Handbook of Geomorphology* (pp. 142–153). SAGE Publications. https://doi.org/10.4135/9781446201053.n8

Smith, V. H., Tilman, G. D., & Nekola, J. C. (1999). Eutrophication: Impacts of Excess Nutrient Inputs on Freshwater, Marine, and Terrestrial Ecosystems. *Environmental Pollution*, *100*(1-3), 179–196. https://doi.org/10.1016/S0269-7491(99)00091-3

Soebowo, E., Tohari, A., & Sarah, D. (2009). Potensi Likuifaksi Akibat Gempabumi Berdasarkan Data CPT dan N-SPT di Daerah Patalan Bantul, Yogyakarta. *RISET Geologi dan Pertambangan*, *19*(2), 85–97. http://dx.doi.org/10.14203/risetgeotam2009.v19.25

Stein, S., & Wysession, M. (2003). *An Introduction to Seismology, Earthquakes, and Earth Structure*. John Wiley & Sons.

Stewart, I. S., & Hancock, P. L. (1988). Normal Fault Zone Evolution and Fault Scarp Degradation in the Aegean Region. *Basin Research*, *1*(3), 139–153. https://doi.org/10.1111/j.1365-2117.1988.tb00011.x

Sunardi, B., Ngadmanto, D., Hardy, T., Susilanto, P., & Nurdiyanto, B. (2012). Kajian Kerawanan Gempabumi Berbasis SIG dalam Upaya Mitigasi Bencana: Studi

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Kasus Kabupaten dan Kota Sukabumi. In *Seminar Nasional Penginderaan Jauh dan SIG 2012*.

Surono. (2008). Litostratigrafi dan Sedimentasi Formasi Kebo dan Formasi Butak di Pegunungan Baturagung, Jawa Tengah Bagian Selatan. *Jurnal Geologi dan Sumberdaya Mineral*, *18*(4), 183–193. https://doi.org/10.17014/ijog.3.4.183-193

Taftsoglou, M., Valkaniotis, S., Papathanassiou, G., Klimis, N., & Dokas, I. (2022). A Detailed Liquefaction Susceptibility Map of Nestos River Delta, Thrace, Greece Based on Surficial Geology and Geomorphology. *Geosciences*, *12*(10), 361. https://doi.org/10.3390/geosciences12100361

Terzaghi, K. (1943). *Theoretical Soil Mechanics*. John Wiley and Sons. https://doi.org/10.1002/9780470172766

Thornbury, W. D. (1969). *Principles of Geomorphology* (2nd ed.). John Wiley and Sons.

Towhata, I. (2022). Earthquake-Induced Landslides and Related Problems. In *Coseismic Landslides: Phenomena, Long-Term Effects and Mitigation* (pp. 41–75). Springer. https://doi.org/10.1007/978-981-19-6597-5_11

Undang-Undang Nomor 24 Tahun 2007 tentang Penanggulangan Bencana. (2007). Lembaran Negara Republik Indonesia Tahun 2007 Nomor 66.

United States Geological Survey. (2006). *M6.3 – Java, Indonesia Earthquake, 2006 May 26 22:54:02 UTC*. https://earthquake.usgs.gov/earthquakes/eventpage/usp000eu6h/executive

Van Westen, C. J., Castellanos, E., & Kuriakose, S. L. (2008). Spatial Data for Landslide Susceptibility, Hazard, and Vulnerability Assessment: An Overview. *Engineering Geology*, *102*(3-4), 112–131. https://doi.org/10.1016/j.enggeo.2008.03.010

Van Zuidam, R. A. (1983). *Guide to Geomorphologic Aerial Photographic Interpretation and Mapping*. International Institute for Geo-Information Science and Earth Observation.

Varnes, D. J. (1978). Slope Movement Types and Processes. In R. L. Schuster & R. J. Krizek (Eds.), *Landslides: Analysis and Control* (Special Report 176, pp. 11–33). Transportation Research Board, National Academy of Sciences.

Verstappen, H. T. (1983). *Applied Geomorphology: Geomorphological Surveys for Environmental Development*. Elsevier Science Publishers. (Terjemahan Sutikno, 2014. *Geomorfologi Terapan: Survei Geomorfologikal untuk Pengembangan Lingkungan*. Penerbit Ombak).

Wald, D. J., Quitoriano, V., Heaton, T. H., & Kanamori, H. (1999). Relationships Between Peak Ground Acceleration, Peak Ground Velocity, and Modified Mercalli Intensity in California. *Earthquake Spectra*, *15*(3), 557–564. https://doi.org/10.1193/1.1586058

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
Randika Satria Putra Dinata, Dr. Muhammad Anggri Setiawan, S.Si., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Wen, H. J., Xie, P., Xiao, P., & Hu, D. P. (2017). Rapid susceptibility mapping of earthquake-triggered slope geohazards in Lushan County by combining remote sensing with the AHP model developed for the Wenchuan earthquake. *Bulletin of Engineering Geology and the Environment*, *76*(3), 909–921. https://doi.org/10.1007/s10064-016-0957-4

Wibowo, N. B., & Sembri, J. N. (2016). Analisis Peak Ground Acceleration (PGA) dan Intensitas Gempabumi Berdasarkan Data Gempabumi Terasa Tahun 1981-2014 di Kabupaten Bantul Yogyakarta. *Indonesian Journal of Applied Physics*, *6*(1), 65–72.

Wibowo, N. B., & Sembri, J. N. (2017). Analisis Seismisitas dan Energi Gempabumi di Kawasan Jalur Sesar Opak-Oyo Yogyakarta. *Jurnal Sains Dasar*, *6*(2), 109–115.

Widada, S., Putra, R. A., Prahastomi, M., & Rizky, A. (2024). Sediment Transport Mechanism and Provenance of Unconsolidated Sediments in Opak River Channel, Yogyakarta, Indonesia. *Jurnal Ilmiah Geologi PANGEA*, *11*(1), 100–113. https://doi.org/10.31315/jigp.v11i1.12805

Wieczorek, G. F., & Snyder, J. B. (1999). *Rock Falls from Glacier Point Above Camp Curry, Yosemite National Park, California* (U.S. Geological Survey Open-File Report 99-385). https://doi.org/10.3133/ofr99385

Wu, Q., Ye, S., Wu, X., & Chen, P. (2004). Risk Assessment of Earth Fractures by Constructing an Intrinsic Vulnerability Map, a Specific Vulnerability Map, and a Hazard Map, Using Yuci City, Shanxi, China as an Example. *Environmental Geology*, *46*(1), 104–112. https://doi.org/10.1007/s00254-004-1020-5

Xu, Q., Li, W., Tang, C., Fan, X., Luo, Y., Zhu, J., ... & Towhata, I. (2022). Report on Landslides Triggered by the 2008 Wenchuan Earthquake. In *Coseismic Landslides: Phenomena, Long-Term Effects and Mitigation* (pp. 1–40). Springer. https://doi.org/10.1007/978-981-19-6597-5_1

Yang, H., Xing, B., He, J., Jiang, H., & Cheng, Q. (2022). The Formation Mechanism and Failure Mode of a Talus Slope Induced by Rockfalls in Nayong County, Southwest China. *Frontiers in Earth Science*, *10*, 973528. https://doi.org/10.3389/feart.2022.973528

Yasuda, S. (1993). Zoning for Slope Instability. *Manual for Zonation on Seismic Geotechnical Hazards*, 43–58. Technical Committee 4, International Society for Soil Mechanics and Geotechnical Engineering.

Yi, Y., Zhang, Z., Zhang, W., Xu, Q., Deng, C., & Li, Q. (2019). GIS-based earthquake-triggered-landslide susceptibility mapping with an integrated weighted index model in Jiuzhaigou region of Sichuan Province, China. *Natural Hazards and Earth System Sciences*, *19*(9), 1973–1988. https://doi.org/10.5194/nhess-19-1973-2019

Yoshimine, M., Nishizaki, H., Amano, K., & Hosono, Y. (2006). Flow Deformation of Liquefied Sand Under Constant Shear Load and Its Application to Analysis of

UNIVERSITAS
GADJAH MADA
Pemetaan Multirawan Bencana Geologi Sekunder (Likuifaksi, Co-Seismic Landslide, dan Rockfall) Berbasis Karakteristik Geomorfologi di Kecamatan Imogiri
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Flow Slide of Infinite Slope. *Soil Dynamics and Earthquake Engineering*, *26*(2-4), 253–264. https://doi.org/10.1016/j.soildyn.2005.02.016

Zhang, J., Cui, P., Zhang, B., Yang, C., & McVerry, G. H. (2010). Earthquake-Induced Landslide Displacement Attenuation Models and Application in Probabilistic Seismic Landslide Displacement Analysis. *Earthquake Engineering and Engineering Vibration*, *9*(2), 177–187. https://doi.org/10.1007/s11803-010-0004-6