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DAFTAR PUSTAKA

Abubakar, A. J., Hashim, M., Pour, A. B., & Shehu, K. (2017). A review of geothermal mapping techniques using remotely sensed data. *Science World Journal*, *12*(4). https://doi.org/10.5555/20183215935

Aggarwal, V., & Singla, M. (2025). Comparative Statistics in Endodontics: A Narrative Review of t-test and Analysis of Variance. *Current Trends in Dentistry*, *2*(2), 68–72. https://doi.org/10.4103/CTD.CTD_29_25

Agustina, D., Tarwotjo, U., & Rahadian, R. (2019). The Effectiveness of Plastic Mulch for Maintaining the Potato Farmland in Dieng Plateau Using Soil Biological Quality Index. *Biosaintifika: Journal of Biology & Biology Education*, *11*(1), 125–131. https://doi.org/10.15294/biosaintifika.v11i1.17804

Ali, N., Metwally, M., Elsawwaf, M., & Nazir, A. (2024). Comprehensive analysis of thermo-mechanical responses in collapsible soil under varied water content conditions. *Journal of Thermal Analysis and Calorimetry 2025 149:23*, *149*(23), 13721–13735. https://doi.org/10.1007/S10973-024-13439-3

Al-Kaisi, M. M., & Lowery, B. (2017). *Soil Health and Intensification of Agroecosystems - 1st Edition | Elsevier Shop* (1st ed.). Academic Press. https://shop.elsevier.com/books/soil-health-and-intensification-of-agroecosystems/al-kaisi/978-0-12-805317-1

Al-Shammary, A. A. G., Al-Shihmani, L. S. S., Fernández-Gálvez, J., & Caballero-Calvo, A. (2025). A comprehensive review of impacts of soil management practices and climate adaptation strategies on soil thermal conductivity in agricultural soils. *Reviews in Environmental Science and Bio/Technology 2025 24:2*, *24*(2), 513–543. https://doi.org/10.1007/S11157-025-09730-W

Anindita, S., Sleutel, S., & Finke, P. (2023). Simulating soil organic carbon stock as affected by land use and climate change on volcanic soils in Indonesia. *Geoderma Regional*, *34*, e00698. https://doi.org/10.1016/j.geodrs.2023.e00698

Antony, D., Collins, C. D., Clark, J. M., & Sizmur, T. (2024). Conversion of forest to cinnamon plantation depletes soil carbon stocks in the top metre of the tropical highlands of Kerinci Regency, Jambi Province, Indonesia. *Soil Use and Management*, *40*(1), e12974. https://doi.org/10.1111/SUM.12974;ISSUE:ISSUE:DOI

Araujo, M. A., Zinn, Y. L., & Lal, R. (2017). Soil parent material, texture and oxide contents have little effect on soil organic carbon retention in tropical highlands. *Geoderma*, *300*, 1–10. https://doi.org/10.1016/J.GEODERMA.2017.04.006

Arifin, M., Devnita, R., Anda, M., Goenadi, D. H., & Nugraha, A. (2022). Characteristics of Andisols Developed from Andesitic and Basaltic Volcanic Ash in Different Agro-Climatic Zones. *Soil Systems 2022, Vol. 6, Page 78*, *6*(4), 78. https://doi.org/10.3390/SOILSYSTEMS6040078

Astisiasari, Hizbaron, D. R., & Setiawan, M. A. (2020). Estimation of land surface temperature in Dieng volcanic complex using tir-based satellite imageries. *IOP Conference Series: Earth and Environmental Science*, *451*(1), 012066. https://doi.org/10.1088/1755-1315/451/1/012066

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Bashir, O., Ali, T., Baba, Z. A., Rather, G. H., Bangroo, S. A., Mukhtar, S. D., Naik, N., Mohiuddin, R., Bharati, V., & Bhat, R. A. (2021). Soil organic matter and its impact on soil properties and nutrient status. In *Microbiota and Biofertilizers, Vol 2: Ecofriendly Tools for Reclamation of Degraded Soil Environs* (Vol. 2, pp. 129–159). Springer International Publishing. https://doi.org/10.1007/978-3-030-61010-4_7/SAVE-RESEARCH

Batjes, N. H. (2014). Total carbon and nitrogen in the soils of the world. *European Journal of Soil Science*, *65*(1), 10–21. https://doi.org/10.1111/ejss.12114_2

Bielders, C. L., De Backer, L. W., & Delvaux, B. (1990). Particle Density of Volcanic Soils as Measured with a Gas Pycnometer. *Soil Science Society of America Journal*, *54*(3), 822–826. https://doi.org/10.2136/sssaj1990.03615995005400030034x

Blake, G. R., & Hartge, K. H. (2018). Particle Density. *Methods of Soil Analysis, Part 1: Physical and Mineralogical Methods*, 377–382. https://doi.org/10.2136/sssabookser5.1.2ed.c14

Bonanomi, G., Idbella, M., Stinca, A., Maisto, G., De Marco, A., Del Galdo, G. P. G., Guarino, R., & Zotti, M. (2023). Nitrogen-fixing cushion Astragalus siculus modulates soil fertility, microclimate, plant facilitation, bacterial and fungal microbiota along an elevation gradient. *Journal of Vegetation Science*, *34*(3), e13193. https://doi.org/10.1111/JVS.13193;WEBSITE:WEBSITE:PERICLES;JOURNAL:JOURNAL:16541103;REQUESTEDJOURNAL:JOURNAL:16541103;WGROUP:STRING:PUBLICATION

Brady, N. C., & Weil, R. R. (2017). *The Nature and Properties of Soils* (15th ed.). Pearson. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Brady%2C+N.+C.%2C+%26+Weil%2C+R.+R.+%282017%29.+The+Nature+and+Properties+of+Soils+%2815th+ed.%29.+Pearson.&btnG=

Chao, J., Zhao, Z., Xu, S., Lai, Z., Liu, J., Zhao, F., Yang, H., & Chen, Q. (2024). Geothermal target detection integrating multi-source and multi-temporal thermal infrared data. *Ore Geology Reviews*, *167*, 105991. https://doi.org/10.1016/J.OREGEOREV.2024.105991

Chaudhari, P. R., Ahire, D. V, Ahire, V. D., Chkravarty, M., & Maity, S. (2013). Soil bulk density as related to soil texture, organic matter content and available total nutrients of Coimbatore soil. *Researchgate.NetPR Chaudhari, DV Ahire, VD Ahire, M Chkravarty, S MaityInternational Journal of Scientific and Research Publications, 2013•researchgate.Net*, *3*(2). https://www.researchgate.net/profile/J-Tarafdar/post/Can_soil_bulk_density_be_calculated_or_extrapolated_from_the_values_of_known_indicators/attachment/59dc8328b53d2f344951fb4b/AS%3A547827744423937%401507623720663/download/ijsrp-p1439.pdf

Chiarucci, A., Calderisi, M., Casini, F., & Bonini, I. (2008). Vegetation at the Limits for Vegetation: Vascular Plants, Bryophytes and Lichens in a Geothermal Field. *Folia Geobotanica 2008 43:1*, *43*(1), 19–33. https://doi.org/10.1007/S12224-008-9002-0

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

Chicco, D., Sichenze, A., & Jurman, G. (2025). A simple guide to the use of Student's t-test, Mann-Whitney U test, Chi-squared test, and Kruskal-Wallis test in biostatistics. *BioData Mining 2025 18:1*, *18*(1), 56-. https://doi.org/10.1186/S13040-025-00465-6

Ciriello, V., Bottarelli, M., Di Federico, V., & Tartakovsky, D. M. (2015). Temperature fields induced by geothermal devices. *Energy*, *93*, 1896–1903. https://doi.org/10.1016/J.ENERGY.2015.10.052

Conant, R. T., Ryan, M. G., Ågren, G. I., Birge, H. E., Davidson, E. A., Eliasson, P. E., Evans, S. E., Frey, S. D., Giardina, C. P., Hopkins, F. M., Hyvönen, R., Kirschbaum, M. U. F., Lavallee, J. M., Leifeld, J., Parton, W. J., Megan Steinweg, J., Wallenstein, M. D., Martin Wetterstedt, J. Å., & Bradford, M. A. (2011). Temperature and soil organic matter decomposition rates - synthesis of current knowledge and a way forward. *Global Change Biology*, *17*(11), 3392–3404. https://doi.org/10.1111/J.1365-2486.2011.02496.X;CTYPE:STRING:JOURNAL

Daebeler, A., Bodelier, P. L. E., Hefting, M. M., Rütting, T., & Laanbroek, H. J. (2017). Soil warming and fertilization altered rates of nitrogen transformation processes and selected for adapted ammonia-oxidizing archaea in sub-arctic grassland soil. *Soil Biology and Biochemistry*, *107*, 114–124. https://doi.org/10.1016/j.soilbio.2016.12.013

Dahlgren, R., Shoji, S., & Nanzyo, M. (1993). Mineralogical characteristics of volcanic ash soils. *Volcanic Ash Soils, Genesis, Properties and Utilization*, 101–145. https://books.google.com/books/about/Volcanic_Ash_Soils.html?id=IvnRg1IAPU0C

Dalampakis, P., Papachristou, M., & Neofotistos, P. (2022). Geothermal resources assessment using temperature–depth relationships in the fault-controlled hydrothermal system of Aristino-Traianoupolis area, Northern Greece. *Geothermal Energy 2022 10:1*, *10*(1), 22-. https://doi.org/10.1186/S40517-022-00232-4

Das, B., & Sivakugan, N. (2017). *Fundamentals of geotechnical engineering*. https://researchonline.jcu.edu.au/42286/

Dec, D., Bravo, S., Clunes, J., Granda, S., López, I., Ordóñez, I., Zúñiga, F., & Dörner, J. (2022). The Role of the Specific Properties of an Andosol as a Water Reservoir to Improve Pasture Growth and Prevent Soil Physical Degradation in Irrigated Grazing Systems. *Journal of Soil Science and Plant Nutrition 2022 22:3*, *22*(3), 3756–3773. https://doi.org/10.1007/s42729-022-00925-6

Delmelle, P., Opfergelt, S., Cornelis, J. T., & Ping, C. L. (2015a). Volcanic Soils. *The Encyclopedia of Volcanoes*, 1253–1264. https://doi.org/10.1016/B978-0-12-385938-9.00072-9

Delmelle, P., Opfergelt, S., Cornelis, J. T., & Ping, C. L. (2015b). Volcanic Soils. *The Encyclopedia of Volcanoes*, 1253–1264. https://doi.org/10.1016/B978-0-12-385938-9.00072-9

Di Donna, A., & Laloui, L. (2015). Response of soil subjected to thermal cyclic loading: Experimental and constitutive study. *Engineering Geology*, *190*, 65–76. https://doi.org/10.1016/J.ENGGEO.2015.03.003

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DiPippo, R. (2016). Elements of thermodynamics, fluid mechanics, and heat transfer applied to geothermal energy conversion systems. *Geothermal Power Generation: Developments and Innovation*, 217–247. https://doi.org/10.1016/B978-0-08-100337-4.00009-7

Dörner, J., Bravo, S., Stoorvogel, M., Dec, D., Valle, S., Clunes, J., Horn, R., Uteau, D., Wendroth, O., Lagos, L., & Zúñiga, F. (2022). Short-term effects of compaction on soil mechanical properties and pore functions of an Andisol. *Soil and Tillage Research*, *221*, 105396. https://doi.org/10.1016/J.STILL.2022.105396

Duan, S., Ru, C., Li, Z., Wang, M., Xu, H., Li, H., Wu, P., Zhan, W., Zhou, J., Zhao, W., Ren, H., Wu, H., Tang, B., Zhang, X., Shang, G., & Qin, Z. (2021). Reviews of methods for land surface temperature retrieval from Landsat thermal infrared data. *National Remote Sensing Bulletin*, *25*(8), 1591–1617. https://doi.org/10.11834/JRS.20211296/

Faizal, M., Bouazza, A., & Singh, R. M. (2016). An experimental investigation of the influence of intermittent and continuous operating modes on the thermal behaviour of a full scale geothermal energy pile. *Geomechanics for Energy and the Environment*, *8*, 8–29. https://doi.org/10.1016/J.GETE.2016.08.001

Gani, R. A., Purwanto, S., & Sukarman. (2021). Karakteristik Tanah Vulkanik di Kabupaten Wonosobo dan Pengelolaannya untuk Pertanian. *Jurnal Tanah Dan Iklim*, *45*(1), 1–11. https://doi.org/10.21082/jti.v45n1.2021.1-11

Gemitzi, A., Dalampakis, P., & Falalakis, G. (2021). Detecting geothermal anomalies using Landsat 8 thermal infrared remotely sensed data. *International Journal of Applied Earth Observation and Geoinformation*, *96*, 102283. https://doi.org/10.1016/J.JAG.2020.102283

Henny, H., Suryanto, Mahbub, I., Dianita, R., & Sinaga, S. M. (2025). CHEMICAL PROPERTIES AND FERTILITY STATUS OF ANDISOLS IN COFFEE PLANTATIONS CONVERTED FROM FOREST IN JAMBI PROVINCE. *Russian Journal of Agricultural and Socio-Economic Sciences*, (6). https://cyberleninka.ru/article/n/chemical-properties-and-fertility-status-of-andisols-in-coffee-plantations-converted-from-forest-in-jambi-province-indonesia

Hillel, D. (2003a). Introduction to Environmental Soil Physics. *Introduction to Environmental Soil Physics*, 1–494. https://doi.org/10.1016/B978-0-12-348655-4.X5000-X

Hillel, D. (2003b). Introduction to Environmental Soil Physics. *Introduction to Environmental Soil Physics*, 1–494. https://doi.org/10.1016/B978-0-12-348655-4.X5000-X

Hochstein, M. P., & Sudarman, S. (2008). History of geothermal exploration in Indonesia from 1970 to 2000. *Geothermics*, *37*(3), 220–266. https://doi.org/10.1016/j.geothermics.2008.01.001

Hoseinimighani, H., & Szendefy, J. (2022). A Review on Mechanisms of Thermally Induced Volume Changes in Fine Soil. *Minerals 2022, Vol. 12, Page 572*, *12*(5), 572. https://doi.org/10.3390/MIN12050572

Huygens, D., Roobroeck, D., Cosyn, L., Salazar, F., Godoy, R., & Boeckx, P. (2010). Microbial nitrogen dynamics in south central Chilean agricultural and

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

forest ecosystems located on an Andisol. *Nutrient Cycling in Agroecosystems 2010 89:2*, *89*(2), 175–187. https://doi.org/10.1007/S10705-010-9386-0

Islam, M., Wehrle, R., Pätzold, S., & Brüggemann, N. (2024). Substantial contribution of inorganic carbon sources to CO2 emissions in calcareous vineyard soils in Germany. *European Journal of Soil Science*, *75*(4), e13551. https://doi.org/10.1111/EJSS.13551;SUBPAGE:STRING:FULL

Kahsay, A., Haile, M., Gebresamuel, G., Mohammed, M., & Okolo, C. C. (2023). Dynamics of soil properties as impacted by contrasting lithology, slope class, and land use types: a case study in semi-arid highlands of northern Ethiopia. *Environmental Monitoring and Assessment 2023 195:9*, *195*(9), 1091-. https://doi.org/10.1007/S10661-023-11706-8

Kobayashi, K., Pillai, K. S., Ramana, L. N., & Thomas, M. W. (2025). Testing normality for quantitative values obtained from repeated dose administration toxicity studies – Fraught with challenges. *Fundamental Toxicological Sciences*, *12*(2), 49–55. https://doi.org/10.2131/FTS.12.49

Kong, G., Fang, J., Lv, Z., & Yang, Q. (2023). Effects of pile and soil properties on thermally induced mechanical responses of energy piles. *Computers and Geotechnics*, *154*, 105176. https://doi.org/10.1016/J.COMPGEO.2022.105176

Kristmannsdóttir, H., & Ármannsson, H. (2003). Environmental aspects of geothermal energy utilization. *Geothermics*, *32*(4–6), 451–461. https://doi.org/10.1016/S0375-6505(03)00052-X

Kurniawan, S., Agustina, M. P., Wiwaha, R. A., Wijaya, A. Y., & Fitria, A. D. (2021). Soil quality degradation under horticulture practices in volcanic slope soil, East Java – Indonesia. *IOP Conference Series: Earth and Environmental Science*, *648*(1), 012062. https://doi.org/10.1088/1755-1315/648/1/012062

Lal, R. (2004). Soil Carbon Sequestration Impacts on Global Climate Change and Food Security. *Science*, *304*(5677), 1623–1627. https://doi.org/10.1126/science.1097396

Leblans, N. I. W., Sigurosson, B. D., Janssens, I. A., & Vicca, S. (2016). *Natural gradients in temperature and nitrogen: Iceland represents a unique environment to clarify long-term global change effects on carbon dynamics* [University of Antwerp]. https://skemman.is/handle/1946/26419

Lehmann, J., & Kleber, M. (2015). The contentious nature of soil organic matter. *Nature 2015 528:7580*, *528*(7580), 60–68. https://doi.org/10.1038/nature16069

Lemenih, M. (2004). *Effects of Land Use Changes on Soil Quality and Native Flora Degradation and Restoration in the Highlands of Ethiopia Implications for sustainable land management*. Swedish University of Agricultiral Sciences.

Li, X., Jiang, G., Tang, X., Zuo, Y., Hu, S., Zhang, C., Wang, Y., Wang, Y., & Zheng, L. (2023). Detecting Geothermal Anomalies Using Multi-Temporal Thermal Infrared Remote Sensing Data in the Damxung–Yangbajain Basin, Qinghai–Tibet Plateau. *Remote Sensing 2023, Vol. 15, Page 4473*, *15*(18), 4473. https://doi.org/10.3390/RS15184473

Lourenço, K. S., Suleiman, A. K. A., Pijl, A., van Veen, J. A., Cantarella, H., & Kuramae, E. E. (2018). Resilience of the resident soil microbiome to organic

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

and inorganic amendment disturbances and to temporary bacterial invasion. *Microbiome 2018 6:1*, *6*(1), 142-. https://doi.org/10.1186/S40168-018-0525-1

Mamenko, M., Lysikova, D. V., Spires, D. R., Tarima, S. S., & Ilatovskaya, D. V. (2022). Practical notes on popular statistical tests in renal physiology. *American Journal of Physiology-Renal Physiolog*, *323*(4), F389–F400. https://doi.org/doi.org/10.1152/ajprenal.00427.20

Marañón-Jiménez, S., Peñuelas, J., Richter, A., Sigurdsson, B. D., Fuchslueger, L., Leblans, N. I. W., & Janssens, I. A. (2019). Coupled carbon and nitrogen losses in response to seven years of chronic warming in subarctic soils. *Soil Biology and Biochemistry*, *134*, 152–161. https://doi.org/10.1016/J.SOILBIO.2019.03.028

Marañón-Jiménez, S., Soong, J. L., Leblans, N. I. W., Sigurdsson, B. D., Peñuelas, J., Richter, A., Asensio, D., Fransen, E., & Janssens, I. A. (2018). Geothermally warmed soils reveal persistent increases in the respiratory costs of soil microbes contributing to substantial C losses. *Biogeochemistry 2018 138:3*, *138*(3), 245–260. https://doi.org/10.1007/S10533-018-0443-0

McGuinness, E., Gibson, A. J., Oakes, J., Farrell, M., & Wells, N. S. (2026). Drivers of Input and Stabilisation Control Subsoil Organic Carbon Content in Perennial Pasture Grazing Systems. *Soil Systems 2026, Vol. 10, Page 33*, *10*(2), 33. https://doi.org/10.3390/SOILSYSTEMS10020033

Mia, M. B., Fujimitsu, Y., & Nishijima, J. (2018). Monitoring Thermal Activity of the Beppu Geothermal Area in Japan Using Multisource Satellite Thermal Infrared Data. *Geosciences 2018, Vol. 8, Page 306*, *8*(8), 306. https://doi.org/10.3390/GEOSCIENCES8080306

Moinet, G. Y. K., Dhami, M. K., Hunt, J. E., Podolyan, A., Liáng, L. L., Schipper, L. A., Whitehead, D., Nuñez, J., Nascente, A., & Millard, P. (2021). Soil microbial sensitivity to temperature remains unchanged despite community compositional shifts along geothermal gradients. *Global Change Biology*, *27*(23), 6217–6231. https://doi.org/10.1111/GCB.15878;WEBSITE:WEBSITE:PERICLES;REQUESTEDJOURNAL:JOURNAL:13652486;ISSUE:ISSUE:DOI

Nanzyo, M., Shoji, S., & Dahlgren, R. (1993a). Chapter 7 Physical Characteristics of Volcanic Ash Soils. *Developments in Soil Science*, *21*(C), 189–207. https://doi.org/10.1016/S0166-2481(08)70268-X

Nanzyo, M., Shoji, S., & Dahlgren, R. (1993b). Chapter 7 Physical Characteristics of Volcanic Ash Soils. *Developments in Soil Science*, *21*(C), 189–207. https://doi.org/10.1016/S0166-2481(08)70268-X

Nascimento, J., Silva, J., Cupertino Bernardes, R., Costa, G., & Emiliano, P. (2024). Statistical data transformation in agrarian sciences for variance analysis: a systematic review. *F1000Research*, *13*, 459. https://doi.org/10.12688/F1000RESEARCH.144805.2

Ningrum, M. H., Fahmi, S., & Laksmita, A. N. (2024a). Analysis of the environmental damage and agricultural utilization in Forest Area of Dieang Plateau, Central Java, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *1315*(1), 012049. https://doi.org/10.1088/1755-1315/1315/1/012049

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Ningrum, M. H., Fahmi, S., & Laksmita, A. N. (2024b). Analysis of the environmental damage and agricultural utilization in Forest Area of Dieang Plateau, Central Java, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *1315*(1). https://doi.org/10.1088/1755-1315/1315/1/012049

Nishar, A., Bader, M. K. F., O'Gorman, E. J., Deng, J., Breen, B., & Leuzinger, S. (2017). Temperature effects on biomass and regeneration of vegetation in a geothermal area. *Frontiers in Plant Science*, *8*, 226263. https://doi.org/10.3389/FPLS.2017.00249/TEXT

Norris, T. B., Wraith, J. M., Castenholz, R. W., & McDermott, T. R. (2002). Soil microbial community structure across a thermal gradient following a geothermal heating event. *Applied and Environmental Microbiology*, *68*(12), 6300–6309. https://doi.org/10.1128/AEM.68.12.6300-6309.2002;WEBSITE:WEBSITE:ASMJ;JOURNAL:JOURNAL:AM;ISSUE:ISSUE:DOI

Nurapita, K. K. R., Samodra, S. B., & Utami, P. (2024). Detecting Geothermal Phenomena at Sikidang Crater Area Based on Ground Penetrating Radar Method. *IOP Conference Series: Earth and Environmental Science*, *1373*(1). https://doi.org/10.1088/1755-1315/1373/1/012032

O'Gorman, E. J., Benstead, J. P., Cross, W. F., Friberg, N., Hood, J. M., Johnson, P. W., Sigurdsson, B. D., & Woodward, G. (2014). Climate change and geothermal ecosystems: Natural laboratories, sentinel systems, and future refugia. *Global Change Biology*, *20*(11), 3291–3299. https://doi.org/10.1111/GCB.12602;JOURNAL:JOURNAL:13652486;WGROUP:STRING:PUBLICATION

Osman, K. T. (2013). Soils: Principles, properties and management. In *Soils: Principles, Properties and Management* (Vol. 9789400756632). Springer Netherlands. https://doi.org/10.1007/978-94-007-5663-2/SAVE-RESEARCH

Ozgener, O., Ozgener, L., & Tester, J. W. (2013). A practical approach to predict soil temperature variations for geothermal (ground) heat exchangers applications. *International Journal of Heat and Mass Transfer*, *62*(1), 473–480. https://doi.org/10.1016/J.IJHEATMASSTRANSFER.2013.03.031

Parfitt, R. L. (2009). *Allophane and imogolite: role in soil biogeochemical processes*. https://doi.org/10.1180/claymin.2009.044.1.135

Peplau, T., Schroeder, J., Gregorich, E., & Poeplau, C. (2021). Long-term geothermal warming reduced stocks of carbon but not nitrogen in a subarctic forest soil. *Global Change Biology*, *27*(20), 5341–5355. https://doi.org/10.1111/GCB.15754;JOURNAL:JOURNAL:13652486;WGROUP:STRING:PUBLICATION

Pérez-Guerrero, E. E., Guillén-Medina, M. R., Márquez-Sandoval, F., Vera-Cruz, J. M., Gallegos-Arreola, M. P., Rico-Méndez, M. A., Aguilar-Velázquez, J. A., & Gutiérrez-Hurtado, I. A. (2024). Methodological and Statistical Considerations for Cross-Sectional, Case–Control, and Cohort Studies. *Journal of Clinical Medicine 2024, Vol. 13, Page 4005*, *13*(14), 4005. https://doi.org/10.3390/JCM13144005

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Perret, S., & Dorel, & M. (1999). Relationships between land use, fertility and Andisol behaviour: examples from volcanic islands. *Soil Use and Management*, *15*, 144–149.

Perusomula, H., & Krishnaiah, S. (2022). Effect of elevated temperature on geotechnical properties of soils – A review. *Materials Today: Proceedings*, *69*, 1130–1133. https://doi.org/10.1016/J.MATPR.2022.08.178

Pippucci, A., Lorenzi, R., Spanò, C., & Sorce, C. (2015a). Stress-induced changes to the flora in a geothermal field in central Italy. *Acta Physiologiae Plantarum 2015 37:10*, *37*(10), 198-. https://doi.org/10.1007/S11738-015-1953-1

Pippucci, A., Lorenzi, R., Spanò, C., & Sorce, C. (2015b). Stress-induced changes to the flora in a geothermal field in central Italy. *Acta Physiologiae Plantarum 2015 37:10*, *37*(10), 198-. https://doi.org/10.1007/S11738-015-1953-1

Poeplau, C., Sigurðsson, P., & Sigurdsson, B. D. (2020a). Depletion of soil carbon and aggregation after strong warming of a subarctic Andosol under forest and grassland cover. *SOIL*, *6*(1), 115–129. https://doi.org/10.5194/soil-6-115-2020

Poeplau, C., Sigurðsson, P., & Sigurdsson, B. D. (2020b). Depletion of soil carbon and aggregation after strong warming of a subarctic Andosol under forest and grassland cover. *SOIL*, *6*(1), 115–129. https://doi.org/10.5194/soil-6-115-2020

Pradana, A., Sara, F. H., & Wahdaningrum, W. (2015). The Analysis of Environmental Degradation and Carica Agroforestry System as an Attempt of Environmental Restoration in Dieng Plateau. *International Journal of Environmental Science and Development*, *6*(11), 861–867. https://doi.org/10.7763/IJESD.2015.V6.713

Ramos, R., Aresti, L., Yiannoukos, L., Tsiolakis, E., Pekris, J., Vieira, A., Florides, G., & Christodoulides, P. (2019a). Thermal and physical characteristics of soils in Cyprus for use in shallow geothermal energy applications. *Energy, Ecology and Environment 2019 4:6*, *4*(6), 300–309. https://doi.org/10.1007/S40974-019-00137-2

Ramos, R., Aresti, L., Yiannoukos, L., Tsiolakis, E., Pekris, J., Vieira, A., Florides, G., & Christodoulides, P. (2019b). Thermal and physical characteristics of soils in Cyprus for use in shallow geothermal energy applications. *Energy, Ecology and Environment 2019 4:6*, *4*(6), 300–309. https://doi.org/10.1007/S40974-019-00137-2

Redha Nugraheni, I., Hernandi Virgianto, R., Kristianto, A., Septiadi, D., Nugroho, H. A., Sugiarto, I., Radjab, F., Nugraheni, I. R., Virgianto, R. H., Kristianto, A., Septiadi, D., Nugroho, H. A., Sugiarto, I., & Radjab, F. (2025). EVALUATING SURFACE TEMPERATURE VARIABILITIES AND CLIMATE EXTREMES IN THE DIENG PLATEAU OVER THREE DECADES. *Indonesian Physical Review*, *8*(2), 597–615. https://doi.org/10.29303/IPR.V8I2.493

Romaguera, M., Vaughan, R. G., Ettema, J., Izquierdo-Verdiguier, E., Hecker, C. A., & van der Meer, F. D. (2018). Detecting geothermal anomalies and evaluating LST geothermal component by combining thermal remote sensing time series and land surface model data. *Remote Sensing of Environment*, *204*, 534–552. https://doi.org/10.1016/J.RSE.2017.10.003

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Rotta Loria, A. F., & Coulibaly, J. B. (2021). Thermally induced deformation of soils: A critical overview of phenomena, challenges and opportunities. *Geomechanics for Energy and the Environment*, *25*, 100193. https://doi.org/10.1016/J.GETE.2020.100193

Rudiarto, I., & Doppler, W. (2013). Impact of land use change in accelerating soil erosion in Indonesian upland area: a case of Dieng Plateau, Central Java-Indonesia. *International Journal of AgriScience*, *3*(7), 558–576. https://www.researchgate.net/profile/Iwan-Rudiarto/publication/285862842_Impact_of_land_use_change_in_accelerating_soil_erosion_in_Indonesian_upland_area_a_case_of_Dieng_Plateau_Central_Java_-_Indonesia/links/570cc32608ae31998899b290/Impact-of-land-use-change-in-accelerating-soil-erosion-in-Indonesian-upland-area-a-case-of-Dieng-Plateau-Central-Java-Indonesia.pdf

Sani, A. K., & Singh, R. M. (2020a). Response of unsaturated soils to heating of geothermal energy pile. *Renewable Energy*, *147*, 2618–2632. https://doi.org/10.1016/J.RENENE.2018.11.032

Sani, A. K., & Singh, R. M. (2020b). Response of unsaturated soils to heating of geothermal energy pile. *Renewable Energy*, *147*, 2618–2632. https://doi.org/10.1016/J.RENENE.2018.11.032

Sasmi, A. T., Dita, A. R. T., & Risnandar, H. (2025). Identification of Geothermal Manifestation by Land Surface Temperature Method in Dieng Plateau, Banjarnegara Regency, Central Java. *IOP Conference Series: Earth and Environmental Science*, *1503*(1), 012009. https://doi.org/10.1088/1755-1315/1503/1/012009

Schaetzl, R. J., & Thompson, M. L. (2015). *Soils : genesis and geomorphology* (2nd ed.). Cambridge University Press. https://books.google.com/books/about/Soils.html?id=u-BwBwAAQBAJ

Sekertekin, A., & Arslan, N. (2019). Monitoring thermal anomaly and radiative heat flux using thermal infrared satellite imagery – A case study at Tuzla geothermal region. *Geothermics*, *78*, 243–254. https://doi.org/10.1016/J.GEOTHERMICS.2018.12.014

Shalihin, M. G. J., Utami, P., & Nurpratama, M. I. (2020). The Subsurface Geology and Hydrothermal Alteration of the Dieng Geothermal Field, Central Java: A Progress Report. *IOP Conference Series: Earth and Environmental Science*, *417*(1), 012010. https://doi.org/10.1088/1755-1315/417/1/012010

Shoji, S., Nanzyo, M., & Dahlgren, R. (1994). *Volcanic ash soils: genesis, properties and utilization* (Vol. 21). Elsevier. https://books.google.com/books?hl=en&lr=&id=IvnRg1IAPU0C&oi=fnd&pg=PP1&dq=Shoji,+S.,+Nanzyo,+M.,+%26+Dahlgren,+R.+A.+(1993).+Volcanic+Ash+Soils:+Genesis,+Properties+and+Utilization.+Elsevier.&ots=OoO3m9b-oH&sig=zxJLTQMXc0X-m9wGmEEzZwhRVsk

Sigurdsson, B. D., Leblans, N. I. W., Dauwe, S., Gudmundsdottir, E., Gundersen, P., Gunnarsdóttir, G. E., Holmstrup, M., Ilieva-Makulec, K., Kätterer, T., Marteinsdóttir, B., Maljanen, M., Oddsdóttir, E. S., Ostonen, I., Peñuelas, J., Poeplau, C., Richter, A., Sigurdsson, P., Van Bodegom, P., Wallander, H., … Janssens, I. (2016). Geothermal ecosystems as natural climate change

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

experiments: The ForHot research site in Iceland as a case study. *Icelandic Agricultural Sciences*, *29*(1), 53–71. https://doi.org/10.16886/IAS.2016.05

Sigurdsson, B. D., Leblans, N. I. W., Dauwe, S., Guðmundsdóttir, E., Gunnarsdóttir, G. E., Holmstrup, M., Ilieva-Makulec, K., Kätterer, T., Marteinsdóttir, B., Maljanen, M., Oddsdóttir, E. S., Ostonen, I., Peñuelas, J., Poeplau, C., Richter, A., Sigurðsson, P., Van Bodegom, P., Wallander, H., Weedon, J., & Janssens, I. (2016). Geothermal ecosystems as natural climate change experiments: The ForHot research site in Iceland as a case study. *ICEL. AGRIC. SCI*, *29*, 53–71. https://doi.org/10.16886/IAS.2016.05

Singh, R. M., Bouazza, A., & Wang, B. (2015). Near-field ground thermal response to heating of a geothermal energy pile: Observations from a field test. *Soils and Foundations*, *55*(6), 1412–1426. https://doi.org/10.1016/J.SANDF.2015.10.007

Six, J., Bossuyt, H., Degryze, S., & Denef, K. (2004). A history of research on the link between (micro)aggregates, soil biota, and soil organic matter dynamics. *Soil and Tillage Research*, *79*(1), 7–31. https://doi.org/10.1016/J.STILL.2004.03.008

Sokal, R. R., & Rohlf, F. James. (2012). *Biometry: The principles and practice of statistics in biological research*. W.H. Freeman.

Steel, R. G. D., Torrie, J. H., & Dicky, D. A. (1997). *Principles and Procedures of Statistics, A Biometrical Approach* (3rd ed.). McGraw Hill, Inc. Book Co. https://www.scirp.org/reference/ReferencesPapers?ReferenceID=1855584

Sudarmadji, & Pudjiastuti, H. (2018). Impacts of Agricultural Practices and Tourism Activities on the Sustainability of Telaga Warna and Telaga Pengilon Lakes, Dieng Plateau, Central Java. *ICENIS: E3S Web of Conferences*, *31*. https://doi.org/10.1051/e3sconf/20183108030

Sukarman, K., Dariah, A., & Suratman, S. (2020). TANAH VULKANIK DI LAHAN KERING BERLERENG DAN POTENSINYA UNTUK PERTANIAN DI INDONESIA / Volcanic Soils in Sloping Dry Land and Its Potential for Agriculture in Indonesia. *Jurnal Penelitian Dan Pengembangan Pertanian*, *39*(1), 21. https://doi.org/10.21082/JP3.V39N1.2020.P21-34

Sumarsih, S., & Virgawati, S. (2013). The assessment of land exploitation by enumerating microbial population: Case study in several locations at Dieng Plateau. *Journal of Tropical Life Science*, *3*(3), 182–186. https://jtrolis.ub.ac.id/index.php/jtrolis/article/view/76

Susilawati, -, Budhisurya, E., Anggono, R. C. W., & Simanjuntak, B. H. (2016). ANALISIS KESUBURAN TANAH DENGAN INDIKATOR MIKROORGANISME TANAH PADA BERBAGAI SISTEM PENGGUNAAN LAHAN DI PLATEAU DIENG. *Agric*, *25*(1), 64–72. https://doi.org/10.24246/agric.2013.v25.i1.p64-72

Thomaz, E. L., & Fachin, P. A. (2014). Effects of heating on soil physical properties by using realistic peak temperature gradients. *Geoderma*, *230–231*, 243–249. https://doi.org/10.1016/J.GEODERMA.2014.04.025

Torn, M. S., Trumbore, S. E., Chadwick, O. A., Vitousek, P. M., & Hendricks, D. M. (1997). Mineral control of soil organic carbon storage and turnover. *Nature 1997 389:6647*, *389*(6647), 170–173. https://doi.org/10.1038/38260

UNIVERSITAS GADJAH MADA
Evaluasi Respon Sifat Fisik-Kimia Tanah Vulkanik terhadap Panas Manifestasi dan Sumur Geotermal pada Lahan Pertanian Hortikultura di Dataran Tinggi Dieng
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Tyas, Z. P., Ngadisih, Murtiningrum, Setyawan, C., Munelson, F., Nuha, Q. H., Susanto, S., & Maftukhah, R. (2026). Estimation of Soil Erosion Potential and Its Correlation with Irrigation Characteristics for Sustainable Organic Agriculture: A Case of the Dieng Region - Indonesia. *IOP Conference Series: Earth and Environmental Science*, *1591*(1), 012019. https://doi.org/10.1088/1755-1315/1591/1/012019

Ugolini, F. C., & Dahlgren, R. A. (2002). Soil development in volcanic ash. *Global Environmental Research, 6(2), 69-81.*, *6*(2), 69–81. https://cir.nii.ac.jp/crid/1573387451546972928

Vidana Gamage, D. N., Biswas, A., & Strachan, I. B. (2019). Spatial variability of soil thermal properties and their relationships with physical properties at field scale. *Soil and Tillage Research*, *193*, 50–58. https://doi.org/10.1016/J.STILL.2019.05.012

Vieira, A., Alberdi-Pagola, M., Christodoulides, P., Javed, S., Loveridge, F., Nguyen, F., Cecinato, F., Maranha, J., Florides, G., Prodan, I., Van Lysebetten, G., Ramalho, E., Salciarini, D., Georgiev, A., Rosin-Paumier, S., Popov, R., Lenart, S., Poulsen, S. E., & Radioti, G. (2017). Characterisation of Ground Thermal and Thermo-Mechanical Behaviour for Shallow Geothermal Energy Applications. *Energies 2017, Vol. 10, Page 2044*, *10*(12), 2044. https://doi.org/10.3390/EN10122044

Vitousek, P. M., & Howarth, R. W. (1991). Nitrogen limitation on land and in the sea: How can it occur? *Biogeochemistry 1991 13:2*, *13*(2), 87–115. https://doi.org/10.1007/BF00002772

Wang, S., Xu, W., & Guo, T. (2024). Advances in Thermal Infrared Remote Sensing Technology for Geothermal Resource Detection. *Remote Sensing 2024, Vol. 16, Page 1690*, *16*(10), 1690. https://doi.org/10.3390/RS16101690

Wardoyo, M. A. I., Prayuda, R., Susena, Y., Baradi, F. A. W., Ashari, A., & Imamah, L. F. (2021). Geomorphological hazard at some area of the Outer Dieng Volcanic Complex post explosive eruption era. *IOP Conference Series: Earth and Environmental Science*, *884*(1), 012007. https://doi.org/10.1088/1755-1315/884/1/012007

Widiawati, Y. (2025). Pengaruh Sistem Pertanian Organik terhadap Kesehatan Tanah dan Keanekaragaman Hayati di Lahan Hortikultura Dataran Tinggi Dieng. *ARMADA : Jurnal Penelitian Multidisiplin*, *3*(6), 194–200. https://doi.org/10.55681/ARMADA.V3I6.1668

Yerima, B., & Ranst, E. Van. (2005). *Introduction to soil science: Soils of the tropics*. Trafford Publishing. https://books.google.com/books?hl=en&lr=&id=wmvJjunJsUIC&oi=fnd&pg=PT3&dq=Yerima,+B.+P.+K.,+%26+Van+Ranst,+E.+(2005).+Introduction+to+Soil+Science:+Soils+of+the+Tropics.+Trafford+Publishing.&ots=Ii-JmOiI8K&sig=vcMQHdrgl4Vj-YeCUwaM-rCIEUc

Zhang, S., Wang, M., Xiao, L., Guo, X., Zheng, J., Zhu, B., & Luo, Z. (2024). Reconciling carbon quality with availability predicts temperature sensitivity of global soil carbon mineralization. *Proceedings of the National Academy of Sciences of the United States of America*, *121*(11), e2313842121. https://doi.org/10.1073/pnas.2313842121

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

Zhang, S., Wang, M., Zheng, J., & Luo, Z. (2026). A global dataset of soil organic carbon mineralization in response to incubation temperature changes. *Earth System Science Data*, *18*(1), 131–146. https://doi.org/10.5194/essd-18-131-2026

Zhao, D., Qiu, J., Fan, Z., Ti, C., Huang, Z., Yan, X., & Xia, Y. (2025). Global Warming Has Imbalance Impact on Soil Nitrogen Transformation Rates. *Earth's Future*, *13*(3), e2024EF004756. https://doi.org/10.1029/2024EF004756