

REFERENCES

- Abdullah, Dahlan et al. 2022. "The Application of K-Means Clustering for Province Clustering in Indonesia of the Risk of the COVID-19 Pandemic Based on COVID-19 Data." *Quality and Quantity* 56(3): 1283–91.
- Aboal, Jesús. 2005. "Allometric Relationships of Different Tree Species and Stand above Ground Biomass in the Gomera Laurel Forest (Canary Islands)." *Elsevier*.
- Agegnehu, Getachew et al. 2021. "Extent and Management of Acid Soils for Sustainable Crop Production System in the Tropical Agroecosystems: A Review." *Acta Agriculturae Scandinavica Section B: Soil and Plant Science* 71(9): 852–69.
- Ahmad, Nasir et al. 2023. "Spatial Prediction of Soil Erosion Risk Using Knowledge-Driven Method in Malaysia's Steepland Agriculture Forested Valley." *Environment, Development and Sustainability*: 1–27.
- Aini, L. N., B. H. Isnawan, and E. Hanudin. 2022. "Land Suitability Re-Evaluation for Fruit Crops in the Post-Eruption Merapi 2010." *IOP Conference Series: Earth and Environmental Science* 985(1).
- Aji, Oktira Roka, Inggita Utami, and Cucu Cahyanti. 2021. "Abundance of Associated Arbuscular Mycorrhizal Fungi with Pioneer Plants in Affected Area by Mount Merapi Eruption." *Jurnal Manajemen Hutan Tropika* 27(2): 109.
- Ali, Asif, Yi Wai Chiang, and Rafael M. Santos. 2022. "X-Ray Diffraction Techniques for Mineral Characterization: A Review for Engineers of the Fundamentals, Applications, and Research Directions." *Minerals* 2022, Vol. 12, Page 205 12(2): 205.
- Ali, Z M, and F Othman. 2017. "Selection of Variogram Model for Spatial Rainfall Mapping Using Analytical Hierarchy Procedure (AHP)." *Scientia Iranica* (1): 28–39.
- Alizadeh, Mohsen et al. 2022. "Remote Sensing Technique and ICONA Based-GIS Mapping for Assessing the Risk of Soil Erosion: A Case of the Rudbar Basin, Iran." *Environmental Earth Sciences* 81(21): 1–18.
- Allen, Judy R M, and Brian Huntley. 2018. "Effects of Tephra Falls on Vegetation: A Late-Quaternary Record from Southern Italy." *Journal of Ecology* 106: 2456–72.
- Alonen, Riina et al. 2014. "Genetic Considerations in Ecosystem Restoration Using Native Tree Species." *Forest Ecology and Management* 333: 66–75.
- Anda, M., and S. Suparto. 2016. "Characteristics of Pristine Volcanic Materials: Beneficial and Harmful Effects and Their Management for Restoration of Agroecosystem." *Science of the Total Environment* 543: 480–92.
- Andrade, Eunice Maia, Maria João Simas Guerreiro, Helba Araújo Queiroz Palácio, and Diego Antunes Campos. 2020. "Ecohydrology in a Brazilian Tropical Dry Forest: Thinned Vegetation Impact on Hydrological Functions and Ecosystem Services." *Journal of Hydrology: Regional Studies* 27: 100649.
- Anggara, Benny et al. 2021. "Fitting the Variogram Model of Nickel Laterite Using Root Means Square Error in Morowali, Central Sulawesi." *IOP Conference*

Series: Earth and Environmental Science 882(1).

- Anggriawan, Rendy, Nuryana Ariska Salsabilla, and Imelda Ayu Prahesti. 2023. "Volcanic Soils: Their Characteristics, Management Practices, and Potential Soluttion for Water Pollution." *SEAS* 7(1): 18–29.
- Ariyanti, Dian, Nurheni Wijayanto, and Iwan Hilwan. 2018. "Keanekaragaman Jenis Tumbuhan Dan Simpanan Karbon Pada Berbagai Tipe Penggunaan Lahan Di Kabupaten Pesisir Barat Provinsi Lampung." *Journal of Tropical Silviculture* 9(3): 167–74.
- Asaad, Irawan, Carolyn J. Lundquist, Mark V. Erdmann, and Mark J. Costello. 2017. "Ecological Criteria to Identify Areas for Biodiversity Conservation." *Biological Conservation* 213: 309–16.
- Atmaja, Muhammad Bima, and Asri Cahyaning Pamuji. 2011. *Tipe Morfologi Dan Anatomi Kulit Batang Pohon Inang Anggrek Epifit Di Petak 5 Bukit Plawangan, Taman Nasional Gunung Merapi*.
- Augustynczyk, Andrey Lessa Derci et al. 2020. "Socially Optimal Forest Management and Biodiversity Conservation in Temperate Forests under Climate Change." *Ecological Economics* 169.
- Ayanlade, Ayansina et al. 2021. "Rainfall Seasonality Effects on Vegetation Greenness in Different Ecological Zones." *Environmental Challenges* 4: 1–12.
- Babu, R. G et al. 2020. "Land-Use and Land-Cover Classification Using a Human Group-Based Particle Swarm Optimization Algorithm with an LSTM Classifier on Hybrid Pre-Processing Remote-Sensing Images." *Remote Sensing* 12(24).
- Badan Standard Naional. 2010. *Sistem Klasifikasi Tutupan Lahan Badan Standard Nasional*. Jakarta.
- Badía, David et al. 2016. "The Influence of Elevation on Soil Properties and Forest Litter in the Siliceous Moncayo Massif, SW Europe." *Journal of Mountain Science* 13(12): 2155–69.
- Baidoo, Richard et al. 2023. "Land Use and Land Cover Changes Implications on Biodiversity in the Owabi Catchment of Atwima Nwabiagya North District, Ghana." *Heliyon* 9(5): e15238.
- Balittanah. 2009. *Analisis Kimia Tanah, Tanaman, Air, Dan Pupuk*. 2nd ed. eds. H Sastramihardja, E Aprillani, S, and F Manalu. Bogor: Indonesian Soil Research Institute.
- Baryshev, E., K. Shmakova, and N. Yakshina. 2019. "Types of Geoecological Research and Areas of Their Application." *IOP Conference Series: Materials Science and Engineering* 572(1): 1–7.
- Beyer, Lothar et al. 1998. "Geo-Ecological Soil Features and the Vegetation Pattern in an Arid Dune Area in the Northern Negev, Israel." *Zeitschrift für Pflanzenernährung und Bodenkunde* 161(4): 347–56.
- Bhan, Manan et al. 2021. "Land Use Increases the Correlation between Tree Cover and Biomass Carbon Stocks in the Global Tropics." *Land* 10(11): 1–15.
- Blyth, S et al. 2002. *Mountain Watch: Environmental Change and Sustainable Development in Mountains. UNEP-WCMC Biodiversity Series 12*. Cambridge

(UK).

- Brown, Sandra, and Ariel E. Lugo. 1984. "Biomass of Tropical Forests: A New Estimate Based on Forest Volumes." *Science* 223(4642): 1290–93.
- Brust, Gerald E. 2019. "Management Strategies for Organic Vegetable Fertility." *Safety and Practice for Organic Food*: 193–212.
- Burnett, Benjamin N., Grant A. Meyer, and Leslie D. McFadden. 2008. "Aspect-Related Microclimatic Influences on Slope Forms and Processes Northeastern Arizona." *Journal of Geophysical Research: Earth Surface* 113(3).
- Calders, Kim et al. 2015. "Nondestructive Estimates of Above-Ground Biomass Using Terrestrial Laser Scanning." *Methods in Ecology and Evolution* 6(2): 198–208.
- Cammeraat, L. H. 2002. "A Review of Two Strongly Contrasting Geomorphological Systems within the Context of Scale." *Earth Surface Processes and Landforms* 27(11): 1201–22.
- Cellek, S. 2020. "Effect of the Slope Angle and Its Classification on Landslide." *Natural Hazards and Earth System Science*: 1–23.
- Chave, Jérôme et al. 2014. "Improved Allometric Models to Estimate the Aboveground Biomass of Tropical Trees." *Global Change Biology* 20(10): 3177–90. <https://pubmed.ncbi.nlm.nih.gov/24817483/> (May 6, 2021).
- Chen, Jin et al. 2020. "Exploring the Effects of Volcanic Eruption Disturbances on the Soil Microbial Communities in the Montane Meadow Steppe." *Environmental Pollution* 267.
- Cheng, Weiming et al. 2011. "Research and Compilation of the Geomorphologic Atlas of the People's Republic of China (1:1,000,000)." *Journal of Geographical Sciences* 21(1): 89–100.
- Ciriminna, Rosaria, Antonino Scurria, Giuseppe Tizza, and Mario Pagliaro. 2022. "Volcanic Ash as Multi-nutrient Mineral Fertilizer: Science and Early Applications." *JSFA reports* 2(11): 528–34.
- Civeira, Gabriela. 2019. *Soil Moisture*. Argentina: IntechOpen.
- Cohen, Jacob. 1968. "Weighted Kappa: Nominal Scale Agreement Provision for Scaled Disagreement or Partial Credit." *Psychological Bulletin* 70(4): 213–20.
- Coulston, John W., Gregory A. Reams, David N. Wear, and C. Kenneth Brewer. 2014. "An Analysis of Forest Land Use, Forest Land Cover and Change at Policy-Relevant Scales." *Forestry* 87(2): 267–76.
- Daigneault, AJ. 2018. "Global Forest Management and Carbon Sequestration Futures under Alternative Shared Socioeconomic Pathways." *Agricultural & Applied Economics Digital Library*: 1–25.
- Daniels, R.C., R.A. Houghton, and J.L. Hackler. 1995. *Continental Scale Estimates of the Biotic Carbon Flux from Land Cover Change: 1850 to 1980*. Oak Ridge, TN.
- Delmelle, Pierre, Sophie Opfergelt, Jean-Thomas Cornelis, and Chien-Lu Ping. 2015. *25 Geologos The Encyclopedia of Volcanoes (Second Edition)*. USA: Academic Press.
- Dendang, Benyamin, and Handayani Wuri. 2015. "Struktur Dan Komposisi Tegakan

- Hutan Di Taman Nasional Gunung Gede Pangrango, Jawa Barat.” *Biodiversitas Journal of Biological Diversity* 1(4): 91–95.
- Deng, Songqiu et al. 2014. “Estimating Forest Aboveground Biomass by Combining ALOS PALSAR and WorldView-2 Data: A Case Study at Purple Mountain National Park, Nanjing, China.” *Remote Sensing* 2014, Vol. 6, Pages 7878-7910 6(9): 7878–7910.
- Dias, J. 2000. “The Karst Region of Bonito, MS: A Proposal for Geoecological Zoning by Landscape Units.” *Revista Ensaios e Ciência: Série Ciências Exatas e Tecnologia* 4(1): 9–43.
- Disperati, Leonardo, Salvatore Gonario, and Pasquale Virdis. 2015. “Assessment of Land-Use and Land-Cover Changes from 1965 to 2014 in Tam Giang-Cau Hai Lagoon, Central Vietnam.” *Applied Geography* 58: 48–64.
- Dossa, Gbadamassi G.O. et al. 2013. “Factors Determining Forest Diversity and Biomass on a Tropical Volcano, Mt. Rinjani, Lombok, Indonesia.” *PLoS ONE* 8(7): 1–11.
- Duan, Aiguo et al. 2019. “Effects of Planting Density on Soil Bulk Density, PH and Nutrients of Unthinned Chinese Fir Mature Stands in South Subtropical Region of China.” *Forests* 10(4): 351.
- Dutca, I, and I V Abrudan. 2010. “Estimation of Forest Land-Cover Change in Romania, between 1990 and 2006.” *Bulletin of the Transilvania University of Braşov* • 3(52): 1–4.
- Dwi, SA, and A Susilowati. 2015. “Diversity and Distribution of Selaginella in the Province of Yogyakarta Special Region Keanekaragaman Jenis Dan Sebaran Selaginella Di Provinsi Daerah Istimewa Yogyakarta.” *PROS SEM NAS MASY BIODIV INDON* 1(5): 987–92.
- El-Desoky, A., A. Hassan, and A. Mahmoud. 2018. “Volcanic Ash as a Material for Soil Conditioner and Fertility.” *Journal of Soil Sciences and Agricultural Engineering* 9(10): 491–95.
- Emaran, Al, Md Abdur Rob, Md Humayun Kabir, and Md Nazrul Islam. 2016. “Modeling Spatio-Temporal Shoreline and Areal Dynamics of Coastal Island Using Geospatial Technique.” *Modeling Earth Systems and Environment* 2(1): 1–11.
- Fan, Guangpeng et al. 2022. “Plot-Level Reconstruction of 3D Tree Models for Aboveground Biomass Estimation.” *Ecological Indicators* 142: 1–10.
- Fang, X M et al. 2015. “Topsoil and Deep Soil Organic Carbon Concentration and Stability Vary with Aggregate Size and Vegetation Type in Subtropical China.” *PLOS ONE* 10(9): 1–17.
- FAO. 2005. *Situation and Developments in the Forest Sector*.
- . 2006. *Ecosystems and Human Well-Being: Current State and Trends: Findings of the Condition and Trends Working Group (Millennium Ecosystem Assessment Series)*. Washington, Covelo, London (US, UK).
- . 2010. *Global Forest Resources Assessment 2010*. Rome: Food and Agriculture Organization of the United Nations.

- . 2011. *Food and Agriculture Organization. 2011. Why Invest in Sustainable Mountain Development?* Italy (IT): Food and Agriculture Organization of the United Nations (FAO).
- Florea, N. 1990. "Geoecological Parametric Methodology [for Soil Inventory Preparation and Land Suitability Evaluation]: Romanian Experience." *Transactions 14th International Congress of Soil Science, Kyoto, Japan, August 1990, Volume V*: 86–91.
- Fung, T, and W Siu. 2000. "Environmental Quality and Its Changes, an Analysis Using NDVI." *Taylor & Francis T Fung, W Siu International Journal of Remote Sensing, 2000•Taylor & Francis* 21(5): 1011–24.
- Funk, Chris et al. 2015. "The Climate Hazards Infrared Precipitation with Stations—a New Environmental Record for Monitoring Extremes." *Scientific Data* 2: 66–87.
- Gebrekiros, Aster, Ralph Mitlöhner, Demel Teketay, and Martin Worbes. 2008. "Climate-Growth Relationships of the Dominant Tree Species from Semi-Arid Savanna Woodland in Ethiopia." *Trees - Structure and Function* 22(5): 631–41.
- German Advisory Council on Global Change (WBGU). 1998. *The Accounting of Biological Sinks and Sources Under the Kyoto Protocol - A Step Forward or Backward for Global Environmental Protection?* Bremerhaven.
- Gertisser, and Keller. 2003. "Trace Element and Sr, Nd, Pb and O Isotope Variations in Medium-K and High-K Volcanic Rocks from Merapi Volcano, Central Java, Indonesia: Evidence for the Involvement of Subducted Sediments in Sunda Arc Magma Genesis." *Journal of Petrology* 44(3): 457–89.
- Gertisser, Ralf, Sylvain J. Charbonnier, Jorg Keller, and Xavier Quidelleur. 2012. "The Geological Evolution of Merapi Volcano, Central Java, Indonesia." *Bulletin of Volcanology* 74(5): 1213–33.
- Giatman, M., S. Haq, and T. Andayono. 2019. "Effect of Porosity on Soil Permeability in the Flood Area of Padang City." *Journal of Physics: Conference Series* 1387(1).
- Gibbs, Holly K, Sandra Brown, John O Niles, and Jonathan A Foley. 2007. "Monitoring and Estimating Tropical Forest Carbon Stocks: Making REDD a Reality." *Environmental Research Letters* 2(4): 045023.
- Gonzalez-Orozco, Carlos E., Esther Garcia Guillen, and Nicolas Cuvil. 2023. "Changes of Cinchona Distribution over the Past Two Centuries in the Northern Andes." *Royal Society Open Science* 10(4).
- González Areu, A. V. et al. 1999. "Physical-Geographical Landscapes of Cayo Guillermo, Ciego de Ávila, Cuba." *Revista del Jardín Botánico Nacional* 20: 159–66.
- Groenendyk, Derek G., Ty P.A. Ferré, Kelly R. Thorp, and Amy K. Rice. 2015. "Hydrologic-Process-Based Soil Texture Classifications for Improved Visualization of Landscape Function." *PLoS ONE* 10(6).
- Gunawan, Hendra et al. 2015. "Invasi Jenis Eksotis Pada Areal Terdegradasi Pasca Erupsi Di Taman Nasional Gunung Merapi." 1(5): 1027–33.
- Gunlu. A, Ercanli. I, Baskent. E.Z., and Cakır. G. 2014. "Estimating Aboveground

- Biomass Using Landsat TM Imagery: A Case Study of Anatolian Crimean Pine Forests in Turkey.” *Annals of Forest Research* 57(2): 289–98.
- Hamilton, Warren. 1973. “Tectonics of the Indonesian Region.” *Geol. Soc. Malaysia, Bulletin* 6: 3–10.
- Hanagarth, Werner, and Andrzej Szwagrzak. 1998. “Geoecology and Biodiversity — Problems and Perspectives for the Management of the Natural Resources of Bolivia’s Forest and Savanna Ecosystems.” *Biodiversity a challenge for development research and policy*: 289–312.
- Hashimoto, Toru, Katsumi Kojima, Takeshi Tange, and Satohiko Sasaki. 2000. “Changes in Carbon Storage in Fallow Forests in the Tropical Lowlands of Borneo.” *Forest Ecology and Management* 126(3): 331–37.
- Heggelund, Laura R. et al. 2013. “Soil PH Effects on the Comparative Toxicity of Dissolved Zinc, Non-Nano and Nano ZnO to the Earthworm *Eisenia Fetida*.” *Taylor & Francis* 8(5): 559–72.
- Hermawan, M. T. T., and H. Marhaento. 2010. *Penataan Zonasi TNGM Tahun 2011 (Setelah Erupsi 2010)*. Yogyakarta.
- Hillmayr, Delia et al. 2020. “The Potential of Digital Tools to Enhance Mathematics and Science Learning in Secondary Schools: A Context-Specific Meta-Analysis.” *Computers and Education* 153: 1–25.
- Hossain, KT, M Salauddin, and IA Tanim. 2016. “Assessment of the Dynamics of Coastal Island in Bangladesh Using Geospatial Techniques: Domar Char.” *Journal of the Asiatic Society of Bangladesh* 42(2): 219–28.
- Houghton, R. A. 2005. “Aboveground Forest Biomass and the Global Carbon Balance.” *Global Change Biology* 11(6): 945–58.
- Hua, Lei, Jianen Gao, Meifang Zhou, and Shilun Bai. 2021. “Impacts of Relative Elevation on Soil Nutrients and Apple Quality in the Hilly-Gully Region of the Loess Plateau, China.” *Sustainability (Switzerland)* 13(3): 1–11.
- Hughes, R. Flint, J. Boone Kauffman, and Victor J. Jaramillo. 1999. “Biomass, Carbon, and Nutrient Dynamics of Secondary Forests in a Humid Tropical Region of Mexico.” *Ecology* 80(6): 1892.
- Hussain, M. 1990. “The Suru Valley in Ladakh: An Amazing Land of Desolate Rocks and Scenic Resources.” *Heritage Publishers*: 171–81.
- Indrajaya, Yonky et al. 2022. “Tropical Forest Landscape Restoration in Indonesia: A Review.” *Land* 2022 11(3): 1–37.
- Ishaq, Rizki M., Kurniatun Hairiah, Ibnu Alfian, and Meine van Noordwijk. 2020. “Natural Regeneration after Volcanic Eruptions: Resilience of the Non-Legume Nitrogen-Fixing Tree *Parasponia Rigida*.” *Front. For. Glob. Change* 3: 562303.
- Isola, Federica, Sabrina Lai, Federica Leone, and Corrado Zoppi. 2023. “Land Take and Landslide Hazard: Spatial Assessment and Policy Implications from a Study Concerning Sardinia.” *Land* 12(2): 1–23.
- IUCN. 2004. *International Union for Conservation of Nature and Natural Resources. World Commission on Protected Areas. 2004. Guidelines for Planning and Managing Mountain Protected Areas*. Switzerland and Cambridge (UK).

- Jakovac, Catarina C. et al. 2021. "The Role of Land-Use History in Driving Successional Pathways and Its Implications for the Restoration of Tropical Forests." *Biological Reviews* 96(4): 1114–34.
- Joshi, Chudamani et al. 2005. "Remotely Sensed Estimation of Forest Canopy Density: A Comparison of the Performance of Four Methods." *International Journal of Applied Earth Observation* 8: 84–95.
- Kapos, Valerie et al. 2000. Forests in sustainable mountain development: A state-of knowledge report for 2000 *Developing a Map of the World's Mountain Forests., Forests in Sustainable Mountain Development: A State of Knowledge Report for 2000*. Wallingford (UK).
- Karlson, Martin et al. 2015. "Mapping Tree Canopy Cover and Aboveground Biomass in Sudano-Sahelian Woodlands Using Landsat 8 and Random Forest." *Remote Sensing* 7(8): 10017–41.
- Kaulfuss, W, M Kramer, and K Mannsfield. 1996. "Contributions of Geographical Landscape Analysis to Model Plans for the Development of Catchment Areas - Grosse Roder." *Wissenschaftliche Zeitschrift der Technischen Universitat Dresden* 45(1): 67–72.
- Kayastha, Prabin. 2015. "Landslide Susceptibility Mapping and Factor Effect Analysis Using Frequency Ratio in a Catchment Scale: A Case Study from Garuwa Sub-Basin, East Nepal." *Arabian Journal of Geosciences* 8(10): 8601–13.
- Komara, Aji Dwi, Esmeralda C Djamal, and Faiza Renaldi. 2016. "Sistem Pendukung Keputusan Penentuan Prioritas Pemadaman Hotspot Kebakaran Hutan Dan Lahan Menggunakan Metode Analytic Hierarchy Process Dan Weighted Product." *Jurnal Teknik Informatika dan Sistem Informasi* 2(3).
- Kong. W.S. 1999. "Geoecological Analysis of the Korea Alpine and Subalpine Plants and Landscapes" eds. G. Balint et al. *Journal of Environmental Sciences* 11(2): 243–46.
- Kosmaryandi, Nandi, Sambas Basuni, Lilik Budi Prasetyo, and Soeryo Adiwibowo. 2012. "Development of National Park Zoning System: A Synthesis of the Importance of Biodiversity Conservation and the Livelihood of Costumary People." IPB (Bogor Agricultural University).
- Krstic, Dragana, Ivica Djalovic, Dragoslav Nikezic, and Dragana Bjelic. 2012. "Aluminium in Acid Soils: Chemistry, Toxicity and Impact on Maize Plants." *Food Production - Approaches, Challenges and Tasks*.
- Kumar, Amit, and Benidhar Deshmukh. 2015. "A Review on 'Geo-Ecological Studies' - An Interdisciplinary Approach for Evaluation and Sustainable Management of 'Geo-Ecosystems.'" *Journal of the Geological Society of India* 86(5): 605–12.
- Kusmana, Cecep et al. 2009. "Komposisi Jenis Dan Struktur Hutan Hujan Tropika Dataran Rendah Di Taman Nasional Danau Sentarum, Kalimantan Barat." *Jurnal Ilmu Pertanian Indonesia* 14(3): 149–57.
- Kusumo, Probo, and Evi Nursari. 2016. "Zonasi Tingkat Kerawanan Banjir Dengan Sistem Informasi Geografis Pada DAS Cidurian Kab. Serang, Banten." *STRING (Satuan Tulisan Riset dan Inovasi Teknologi)* 1(1).

- Kuswantoro, Farid, M. B Atmaja, W. R Permana, and Trijoko. 2011. "Diversity and Feeding Habit of Anura in Plawangan Hill, Yogyakarta after Mount Merapi Eruption 2010." *ICBS BIO-UGM 2011*.
- Lacey, Eileen A., Risa Takenaka, Katie Labarbera, and Mauro N. Tammone. 2019. "Ecological and Demographic Impacts of a Recent Volcanic Eruption on Two Endemic Patagonian Rodents." *PLoS ONE* 14(3).
- Laguna, E. et al. 2004. "The Role of Small Reserves in Plant Conservation in a Region of High Diversity in Eastern Spain." *Biological Conservation* 119(3): 421–26.
- Latifah, Sitti, Eni Hidayati, and Niechi Valentino. 2022. "Soil Characteristics of Six Forest Management Regimes in Lombok, Indonesia." *Jurnal Belantara* 5(1): 59–71.
- Li, Jiayi et al. 2022. "Organic Materials with High C/N Ratio: More Beneficial to Soil Improvement and Soil Health." *Biotechnology Letters* 44(12): 1415–29. <https://link.springer.com/article/10.1007/s10529-022-03309-z> (July 5, 2023).
- Lindenmayer, David, Ben C. Scheele, Tyrone Lavery, and Gene E. Likens. 2023. "Biodiversity Response to Rapid Successive Land Cover Conversions in Human-Dominated Landscapes." *Global Ecology and Conservation* 45: e02510.
- Liu, Junze et al. 2022. "Study on Functional Zoning Method of National Park Based on MCDA: The Case of the Proposed 'Ailaoshan-Wuliangshan' National Park." *Land* 2022, Vol. 11, Page 1882 11(11): 1882.
- Llado, Salvador, Ruben Lopez-Mondejar, and Petr Baldrian. 2017. "Forest Soil Bacteria: Diversity, Involvement in Ecosystem Processes, and Response to Global Change." *Microbiology and Molecular Biology Reviews* 81(2).
- Lodhiyal, Neelu, and L.S Lodhiyal. 2003. "Biomass and Net Primary Productivity of Bhabar Shisham Forests in Central Himalaya, India." *Forest Ecology and Management* 176(1–3): 217–35.
- Loveland Thomas, R., and R. Mahmood. 2014. "A Design for a Sustained Assessment of Climate Forcing and Feedbacks Related to Land Use and Land Cover Change." *Bulletin of the American Meteorological Society* 95(10): 1563–72.
- Lu, Dengsheng et al. 2016. "A Survey of Remote Sensing-Based Aboveground Biomass Estimation Methods in Forest Ecosystems." *International Journal of Digital Earth* 9(1): 63–105.
- Lubis, R. L. et al. 2021. "Chemical Properties of Volcanic Soil after 10 Years of the Eruption of Mt. Sinabung (North Sumatera, Indonesia)." *IOP Conference Series: Earth and Environmental Science* 757(1): 012043.
- Lundback, Mikael, Henrik Persson, Carola Häggstrom, and Tomas Nordfjell. 2021. "Global Analysis of the Slope of Forest Land." *Forestry: An International Journal of Forest Research* 94(1): 54–69.
- Makero, Joseph S., Japhet J. Kashaigili, Joseph S. Makero, and Japhet J. Kashaigili. 2016. "Analysis of Land-Cover Changes and Anthropogenic Activities in Itigi Thicket, Tanzania." *Advances in Remote Sensing* 5(4): 269–83.
- Malahayati, Marissa, and Toshihiko Masui. 2019. "The Impact of Green House Gas Mitigation Policy for Land Use and the Forestry Sector in Indonesia: Applying

- the Computable General Equilibrium Model.” *Forest Policy and Economics*: 1–22.
- Malhi, Y, and J Grace. 2000. “Tropical Forests and Atmospheric Carbon Dioxide.” *Trends in Ecology & Evolution* 15(8): 332–37.
- Mallik, AU, EG Lamb, and H Rasid. 2001. “Vegetation Zonation among the Microhabitats in a Lacustrine Environment: Analysis and Application of Belowground Species Trait Patterns.” *Elsevier* 18: 135–46.
- Marti, Joan, and G J Ernst. 2005. *Volcanoes and the Environment*. Cambridge: Cambridge University Press.
- Maulana, Edwin et al. 2017. “Geoecology Identification Using Landsat 8 for Spatial Planning in North Sulawesi Coastal.” *Indonesian Journal of Geography* 49(2): 212–17.
- Meng, Liu., and Popescu Sorin. 2022. “ Estimation of Biomass Burning Emissions by Integrating ICESat-2, Landsat 8, and Sentinel-1 Data.” *Remote Sensing of Environment* 280.
- Midriak, R. et al. 1998. “Diversity of Abiotic Environment and Biota in the Zboj Creek Catchment in the Poloniny National Park.” *Acta Facultatis Ecologiae Zvolen* 5: 13–24.
- Mihalic, S, M Ostric, and M Krkac. 2011. “Seismic Microzonation: A Review of Principles and Practice.” *Geofizika* 28: 1–19.
- Mon, Myat Su et al. 2012. “Estimating Forest Canopy Density of Tropical Mixed Deciduous Vegetation Using Landsat Data: A Comparison of Three Classification Approaches.” *International Journal of Remote Sensing* 33(4): 1042–57.
- Montès, N. et al. 2000. “A Non-Destructive Method for Estimating above-Ground Forest Biomass in Threatened Woodlands.” *Forest Ecology and Management* 130(1–3): 37–46.
- Moran, Emilio F. et al. 2000. “Effects of Soil Fertility and Land-Use on Forest Succession in Amazônia.” *Forest Ecology and Management* 139(1–3): 93–108.
- Munoz Mazon, Miguel et al. 2020. “How Forest Structure Varies with Elevation in Old Growth and Secondary Forest in Costa Rica.” *Forest Ecology and Management* 469: 118191.
- Munthafa, Agnia Eva, and Husni Mubarak. 2017. “Penerapan Metode Analytical Hierarchy Process Dalam Sistem Pendukung Keputusan Penentuan Mahasiswa Berprestasi.” *Jurnal Siliwangi Seri Sains dan Teknologi* 3(2).
- Muslih, M. M. 2019. “Analisis Vegetasi Penyusun Hutan Alam Bukit Plawangan Pada Tingkatan Tiang Dan Pohon.” Universitas Gadjah Mada.
- Mutaqien, Zaenal, Prihadi Santoso, and Joko Kusmoro. 2008. “Studi Vegetasi Hutan Hujan Tropis Pegunungan Di Gunung Manglayang Jawa Barat.”
- Nabuurs, G.J., and O. Masera. 2007. “Forestry, in Climate Change 2007: Mitigation.” In *Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. B. Metz et al. Cambridge: Cambridge University Press, 541–84.
- Nackoney, J. et al. 2022. “Coupled Forest Zoning and Agricultural Intervention Yields

- Conflicting Outcomes for Tropical Forest Conservation in the Democratic Republic of the Congo (DRC).” *Environmental Research Letters* 17(6): 1–11.
- Mac Nally, Ralph et al. 2008. “Variation in Widths of Riparian-Zone Vegetation of Higher-Elevation Streams and Implications for Conservation Management.” *Plant Ecology* 198(1): 89–100.
- Natalia, Dyna, and Trikinasih Handayani. 2013. “Analisis Vegetasi Strata Semak Di Plawangan Taman Nasional Gunung Merapi Pasca Erupsi Merapi 2010.” *JURNAL BIOEDUKATIKA* 1(1): 62–71.
- Návar, José. 2009. “Allometric Equations for Tree Species and Carbon Stocks for Forests of Northwestern Mexico.” *Forest Ecology and Management* 257(2): 427–34. <https://www.sciencedirect.com/science/article/pii/S037811270800697X> (June 9, 2019).
- Negassa, Milkessa Dangia, Demissie Tsega Mallie, and Dessalegn Obsi Gemed. 2020. “Forest Cover Change Detection Using Geographic Information Systems and Remote Sensing Techniques: A Spatio-Temporal Study on Komto Protected Forest Priority Area, East Wollega Zone, Ethiopia.” *Environmental Systems Research* 2020 9:1 9(1): 1–14.
- Neina, Dora. 2019. “The Role of Soil PH in Plant Nutrition and Soil Remediation.” *Hindawi*: 1–9.
- Nepali, Babu Ram, John Skartveit, and Chitra Bahadur Baniya. 2021. “Impacts of Slope Aspects on Altitudinal Species Richness and Species Composition of Narapani-Masina Landscape, Arghakhanchi, West Nepal.” *Journal of Asia-Pacific Biodiversity* 14(3): 415–24.
- Nirmal, K J I., P Kanti, Kanti, and B. Rohit K. 2011. “Forest Structure, Diversity and Soil Properties in a Dry Tropical Forest in Rajasthan, Western India.” *Annals of Forest Research* 54(1): 89–98.
- Njana, Marco Andrew, Boniface Mbilinyi, and Zahabu Eliakimu. 2021. “The Role of Forests in the Mitigation of Global Climate Change: Emprical Evidence from Tanzania.” *Environmental Challenges* 4. https://www.researchgate.net/publication/352250832_The_role_of_forests_in_the_mitigation_of_global_climate_change_Emprical_evidence_from_Tanzania (December 16, 2023).
- Nowak, David J. 1993. “Atmospheric Carbon Reduction by Urban Trees.” *Journal of Environmental Management* 37(3): 207–17.
- Nugraha, A. S.A., and I. P. A. Citra. 2020. “Modifikasi Model Forest Canopy Density (FCD) Pada Citra Landsat 8 Multi-Temporal Untuk Monitoring Perubahan Tutupan Vegetasi Di Kecamatan Sukasada-Bali.” *Jurnal Penginderaan Jauh dan Pengolahan Data Citra Digital* 17(02): 149–59.
- Nugroho, Sigit, I Nengah Surati Jaya, M Buce Saleh, and Antonius Bambang Wijanarto. 2012. “Detection Method of Forest Degradation Using Landsat Satellite Image at Dry Land Forest in Gunung Halimun Salak National Park.” Institute Pertanian Bogor.
- Nugroho, Yusanto et al. 2022. “A Comparison of Soil Characteristics from Four Land

- Covers around a Coal Mining Concession Area in South Kalimantan - Google Search.” *Journal of Degraded and Mining Lands Management* 10(1): 3883–88.
- Nur, Wawan Hendriawan et al. 2021. “Overview about Gis Multi-Criteria Spatial Analysis for Micro Hydropower Plant Site Suitability in South Ogan Komering Ulu District, South Sumatera, Indonesia.” *Bulletin of Electrical Engineering and Informatics* 10(2): 1024–34.
- Nuranisa, Septi, Eming Sudiana, and Edy Yani. 2020. “Hubungan Umur Dengan Stok Karbon Pohon Duku (*Lansium Parasiticum*) Di Desa Kalikajar Kecamatan Kaligondang Kabupaten Purbalingga.” *BioEksakta: Jurnal Ilmiah Biologi Unsoed* 2(1): 146–51.
- Nuryadi, and Djoko Marsono. 2004. “Kajian Penentuan Zonasi Pada Taman Nasional Gunung Merapi.” Universitas Gadjah Mada.
- Olehowski, C., S. Naumann, D. Fischer, and A. Siegmund. 2008. “Geo-Ecological Spatial Pattern Analysis of the Island of Fogo (Cape Verde).” *Global and Planetary Change* 64(3–4): 188–97.
- Olofsson, Pontus et al. 2014. “Good Practices for Estimating Area and Assessing Accuracy of Land Change.” *Remote Sensing of Environment* 148: 42–57.
- Omar, Hamdan. 2010. “Slope Stability Using Remote Sensing and Geographic Information System Along Karak Highway, Malaysia.” Universiti Teknologi Malaysia.
- Ortiz, Aurelio, and Estibaliz Sansinenea. 2022. “The Role of Beneficial Microorganisms in Soil Quality and Plant Health.” *Sustainability* 14(9): 1–13.
- Osipov, Aleksey et al. 2021. “Spatial Geoecological Modeling of the Natural-Agrarian Potential of the Region Landscapes.” *E3S Web of Conferences* 244: 1–9.
- Pala, N.A. et al. 2013. “Carbon Stock Estimation for Tree Species of Sem Mukhem Sacred Forest in Garhwal Himalaya, India.” *Journal of Forestry Research* 24(3): 457–60.
- Paoli, Gary D., Lisa M. Curran, and J. W.F. Slik. 2008. “Soil Nutrients Affect Spatial Patterns of Aboveground Biomass and Emergent Tree Density in Southwestern Borneo.” *Oecologia* 155(2): 287–99.
- Parwati, Anggiyani Fabilah et al. 2019. “Analisis Vegetasi Di Taman Nasional Gunung Merapi.” *Jurnal Penelitian Sosial dan Ekonomi Kehutanan* 5(2): 107–12.
- Pasaribu, Pinta Omas et al. 2021. “Komposisi Dan Keanekaragaman Tumbuhan Bawah Di Kawasan Yang Terkena Dan Tidak Terkena Erupsi Di Taman Nasional Gunung Merapi, Yogyakarta.” *BIOMA* 17(1): 37–46.
- Pawar, K.V., and Ravi V. Rothkar. 2015. “Forest Conservation & Environmental Awareness.” *Procedia Earth and Planetary Science* 11: 212–15.
- Pawar, Rakesh M. 2015. “The Effect of Soil PH on Bioremediation of Polycyclic Aromatic Hydrocarbons (PAHS).” *Journal of Bioremediation & Biodegradation* 06(03).
- Payne, Davnah et al. 2020. “Mountain Biodiversity Is Central to Sustainable Development in Mountains and Beyond.” *One Earth* 3(5): 530–33.
- Pérez, Francisco L. 2020. “Growth of *Grimmia* Mosses on Volcanic Tephra:

- Geoecological Processes of Biocrust Development in Haleakalā Crater (Maui, Hawai'i)." *Catena* 195.
- Permentier, Kris, Steven Vercammen, Sylvia Soetaert, and Christian Schellekens. 2017. "Carbon Dioxide Poisoning: A Literature Review of an Often Forgotten Cause of Intoxication in the Emergency Department." *International journal of emergency medicine* 10(1).
- Philip M.F, and William F.L. 2003. "Comment on "Determination of Deforestation Rates of the World's Humid Tropical Forests"" *Science* 299(5609): 1015a – 1015.
- Pickarski, Nadine, Ola Kwiecien, and Thomas Litt. 2023. "Volcanic Impact on Terrestrial and Aquatic Ecosystems in the Eastern Mediterranean." *Communications Earth and Environment* 4(1).
- Pociask-Karteczka, J. 2019. *Sustainable Water Resources Management in High Mountains in the Baltic Sea Region*. eds. Zygmunt Górka, Tomasz Bryndal, and Wiesław Ziąja. Institute of Geography and Spatial Management Jagiellonian University.
- Potapov, A. D., and S. N. Chernyshev. 2013. "Geo-Ecology of The Subterranean Space Within the Framework of Environmental Sciences." *Vestnik MGSU* 8(1): 168.
- Potapov, A. D., I. M. Senyushchenkova, O. O. Novikova, and E. A. Gudkova. 2013. "Problem of Use of Disturbed Urban Areas." *Vestnik MGSU* 2(9): 166–88.
- Prach, Karel, Karol Ujházy, Vlastimil Knopp, and Josef Fanta. 2021. "Two Centuries of Forest Succession, and 30 Years of Vegetation Changes in Permanent Plots in an Inland Sand Dune Area, The Netherlands." *PLOS ONE* 16(4): 1–16.
- Pradipta, Meila Ika. 2020. "Klasifikasi Curah Hujan Menggunakan Metode Ensemble Subset K-Nearest Neighbor (Studi Kasus : Curah Hujan Kota Bogor Tahun 2014 – 2018)." Universitas Islam Indonesia.
- Prasetyo, Dwi Juli, and Suprpto Dibiyosaputro. 2014. "Kajian Kerawanan Longsor Lahan Menggunakan Metode Analytical Hierarchy Process Dan Sistem Informasi Geografis Di DAS Ijo Daerah Istimewa Yogyakarta." *Jurnal Bumi Indonesia* 3(3): 228567.
- Pratiwi, K. S. 2020. "Pengembangan Wisata Birdwatching Sebagai Wisata Minat Khusus Di Bukit Plawangan, Gunungapi Merapi." Universitas Gadjah Mada.
- Priambodo, Rizky et al. 2021. "Inventarisasi Dan Studi Asosiasi Anggrek Epifit Dengan Pohon Inang Di Kawasan Bukit Plawangan, Taman Nasional Gunung Merapi." *BIOMA* 1(3).
- Proctor, John, Ian D. Edwards, Robert W. Payton, and Laszlo Nagy. 2007. "Zonation of Forest Vegetation and Soils of Mount Cameroon, West Africa." *Plant Ecology* 192(2): 251–69.
- Pujiono, Eko, Ronggo Sadono, Hartono, and Muhammad Ali Imron. 2019. "A Three Decades Assessment of Forest Cover Changes in The Mountainous Tropical Forest of Timor Island, Indonesia." *Jurnal Manajemen Hutan Tropika* (Vol. 25 No. 1 (2019)): 51.
- Purwohandoyo, Joni et al. 2023. "Spatial Multi-Criterion Analysis (SMCA) to

- Determine the Suitability of Green Open Space (GOS) at Kalurahan Wonokromo, Special Region of Yogyakarta.” *International Review for Spatial Planning and Sustainable Development* 11(1): 158–75.
- Pusparini, Wulan et al. 2023. “A Bolder Conservation Future for Indonesia by Prioritising Biodiversity, Carbon and Unique Ecosystems in Sulawesi.” *Scientific Reports* 13(1): 1–13.
- Qu, Mingnan et al. 2017. “Leaf Photosynthetic Parameters Related to Biomass Accumulation in a Global Rice Diversity Survey.” *Plant Physiology* 175: 248–58.
- Rachmat, Henti Hendalastuti et al. 2021. “Generating Multifunctional Landscape through Reforestation with Native Trees in the Tropical Region: A Case Study of Gunung Dahu Research Forest, Bogor, Indonesia.” *Sustainability* 2021, Vol. 13, Page 11950 13(21): 11950.
- Raftery, Adrian E., and Nema Dean. 2006. “Variable Selection for Model-Based Clustering.” *Journal of the American Statistical Association* 101(473): 168–78.
- Raihan, Asif, Nizam Mohd Said, Sharifah Mastura Syed Abdullah, and Rawshan Ara Begum. 2018. “Climate Change Mitigation Options in the Forestry Sector of Malaysia.” *Jurnal Kejuruteraan* 11(6): 89–98.
- Ramesh, Thangavel et al. 2019. “Soil Organic Carbon Dynamics: Impact of Land Use Changes and Management Practices: A Review.” *Advances in Agronomy* 156: 1–107.
- Ravindranath, N.H., and M. Ostwald. 2008. “Methods for Estimating Above-Ground Biomass.” In *Advances in Global Change Research*, Dordrecht: Springer Netherlands, 113–47.
- Reza, Mohammad Imam Hasan, and Saiful Arif Abdullah. 2016. “Developing Ecosystem Maps Using Eco-Geological Information for the Sustainable Management of Natural Resources.” *Open Journal of Ecology* 06(06): 343–57.
- Richards, P.W. 1996. “The Tropical Rain Forest, 2nd Edition. Cambridge University Press, Cambridge.”
- Rikimaru, A, P.S. Roy, and S Miyatake. 2002. “Tropical Forest Cover Density Mapping.” *Tropical Ecology* 43(1): 39–47.
- Riswandi, Herry, Emi Sukiyah, Boy Yoseph C.S.S. S Alam, and Muhamad Sapari Dwi Hadian. 2020. “Morphotectonic Identification Utilizing Satellite Imagery Processing on the Southern Part of Merapi Mount in Yogyakarta.” *International Journal on Advanced Science, Engineering and Information Technology* 10(3): 1333.
- Roy, D. P. et al. 2016. “Characterization of Landsat-7 to Landsat-8 Reflective Wavelength and Normalized Difference Vegetation Index Continuity.” *Remote Sensing of Environment* 185: 57–70.
- RSPO. 2017. *RSPO Guidance for Land Use Change Analysis*.
- Rusu, Eugen. 2013. 7 Present environment and sustainable development *The Current Situation of the Stock of Carbon in Forest Ecosystems at Regional and Global*.
- Saaty, T L. 1980. *The Analytic Hierarchy Process*. New York.
- Sadono, Ronggo et al. 2022. “Land Cover and Carbon Storage in a Certified

- Sustainable Community Forest in Sumberejo Village, Wonogiri, Central Java, Using Landsat Data Series 2000, 2015 and 2020.” *Agriculture and Forestry* 68(3): 183–98.
- Sadono, Ronggo, Eko Pujiono, and Linda Lestari. 2020. “Land Cover Changes and Carbon Storage before and after Community Forestry Program in Bleberan Village, Gunungkidul, Indonesia, 1999–2018.” *Forest Science and Technology* 16(3): 134–44.
- Sadono, Ronggo, Wahyu Wardhana, and Pandu Yudha Adi Putra Wirabuana. 2023. “Estimating Carbon Storage of Eucalyptus Urophylla Vegetation in Mutis Timau Nature Reserve, East Nusa Tenggara, Indonesia Using Remote Sensing Analysis.” *Biodiversitas* 24(4): 1946–52.
- Sandra, Brown, Gillespie Andrew, and Ariel E. Lugo. 1989. “Biomass Estimation Methods for Tropical Forests with Applications to Forest Inventory Data.” *Forest Science* 35(4): 881–902.
- Santika, Truly. et al. 2017. “Community Forest Management in Indonesia: Avoided Deforestation in the Context of Anthropogenic and Climate Complexities.” *Global Environmental Change* 46: 60–71.
- Santoro, Maurizio et al. 2022. “Global Estimation of Above-Ground Biomass from Spaceborne C-Band Scatterometer Observations Aided by LiDAR Metrics of Vegetation Structure.” *Remote Sensing of Environment* 279: 1–23.
- Santos, Maria J., Adam B. Smith, James H. Thorne, and Craig Moritz. 2017. “The Relative Influence of Change in Habitat and Climate on Elevation Range Limits in Small Mammals in Yosemite National Park, California, U.S.A.” *Climate Change Responses* 4(1).
- Saputra, Danny Dwi et al. 2022. “Recovery after Volcanic Ash Deposition: Vegetation Effects on Soil Organic Carbon, Soil Structure and Infiltration Rates.” *Plant and Soil* 474(1–2): 163–79.
- Scharlemann, Jrn P.W. et al. 2010. “Securing Tropical Forest Carbon: The Contribution of Protected Areas to REDD.” *ORYX* 44(3): 352–57.
- Schickhoff, U. 1993. “The Kaghan Valley in the Western Himalayas (Pakistan). Studies on Geo-Ecological Differentiation and Landscape Change, with an Appendix on the Vegetation.” *Bonner Geographische Abhandlungen* (87): 268.
- Schlamadinger, Bernhard, and Gregg Marland. 1996. “The Role of Forest and Bioenergy Strategies in the Global Carbon Cycle.” *Biomass and Bioenergy* 10(5–6): 275–300.
- Schuster, Richard et al. 2023. “Protected Area Planning to Conserve Biodiversity in an Uncertain Future.” *Conservation Biology* 37(3): 1–9.
- Segura, Milena, and Markku Kanninen. 2005. “Allometric Models for Tree Volume and Total Aboveground Biomass in a Tropical Humid Forest in Costa Rica1.” *Biotropica* 37(1): 2–8. <http://doi.wiley.com/10.1111/j.1744-7429.2005.02027.x> (June 9, 2019).
- Setiawan, H, A Wibowo, and Supriatna. 2021. “Pembuatan Peta Curah Hujan Untuk Evaluasi Kesesuaian Rencana Tata Ruang Kawasan Hutan Kabupaten Bogor.”

- Geomedia Majalah Ilmiah dan Informasi Kegeografian*: 113–21.
- Setiyono, Heryoso, Azis Nur Bambang Bambang, Muhammad Helmi, and Muh Yusuf. 2022. “Effect Rainfall Season on Coastal Flood in Semarang City, Central Java, Indonesia.” *International journal of health sciences* 6(S1): 7584–95.
- Sharma, Chandra M. et al. 2010. “Tree Diversity and Carbon Stocks of Some Major Forest Types of Garhwal Himalaya, India.” *Forest Ecology and Management* 260(12): 2170–79.
- Sheikh, Mehraj A., Sanjay Kumar, and Munesh Kumar. 2012. “Above and below Ground Organic Carbon Stocks in a Sub-Tropical Pinus Roxburghii Sargent Forest of the Garhwal Himalayas.” *Forestry Studies in China* 14(3): 205–9.
- Sheikh, Mehraj A, Munesh Kumar, and Rainer W Bussmann. 2009. “Altitudinal Variation in Soil Organic Carbon Stock in Coniferous Subtropical and Broadleaf Temperate Forests in Garhwal Himalaya.” *Carbon Balance and Management* 4(1): 6.
- Shen, Xiangjin et al. 2021. “Aboveground Biomass and Its Spatial Distribution Pattern of Herbaceous Marsh Vegetation in China.” *Science China Earth Sciences* 64(7): 1115–25. <https://link.springer.com/article/10.1007/s11430-020-9778-7> (January 8, 2024).
- Shetty, Swathi, Pruthviraj Umesh, and Amba Shetty. 2022. “Dependability of Rainfall to Topography and Micro-Climates: An Observation Using Geographically Weighted Regression.” *Theoretical and Applied Climatology* 147(1–2): 217–37.
- Shoji, Sadao, and Tadashi Takahashi. 2002. “Environmental and Agricultural Significance of Volcanic Ash Soils.” *Global Environmental Research-English Edition* 6(2): 113–35.
- Shrivastav, Preksha et al. 2020. “Role of Nutrients in Plant Growth and Development.” In *Contaminants in Agriculture: Sources, Impacts and Management*, Springer International Publishing, 43–59.
- Shumba, Tafadzwa et al. 2020. “Effectiveness of Private Land Conservation Areas in Maintaining Natural Land Cover and Biodiversity Intactness.” *Global Ecology and Conservation* 22: 1–11.
- Siahaan, M. R. P., E Sukiyah, N Sulaksana, and A. D. Haryanto. 2022. “Assessment of Active Tectonic from Morphometric Properties in Krueng Raya Watershed, Aceh Besar, Indonesia.” *engineering letters* 30: 1–9.
- Silva, EV, A Gorayeb, and AJA Meireles. 2011. “Landscape Geo-Ecology: Guidelines for the Environmental Management of the Estuarine Zones of the Northern Coast of Brazil.” *Journal of Coastal* 64: 1420–24.
- Sima, M, I Bergkvist, B Lofgren, and S Berg. 2012. “A GIS Approach to Analyzing Off-Road Transportation: A Case Study in Sweden.” *Croatian Journal of Forest Engineering* 33(2): 275–84.
- Simanjuntak, C. M., D. Elfiati, and D. Delvian. 2015. “Dampak Erupsi Gunung Sinabung Terhadap Sifat Kimia Tanah Di Kabupaten Karo.” *Peronema Forestry Science Journal* 4(4): 53–58.
- Singh, Brajesh K., and Allan Walker. 2006. “Microbial Degradation of

- Organophosphorus Compounds.” *FEMS Microbiology Reviews* 30(3): 428–71.
<https://dx.doi.org/10.1111/j.1574-6976.2006.00018.x> (July 3, 2023).
- Singh, Brajesh K., Allan Walker, J. Alun W. Morgan, and Denis J. Wright. 2003. “Role of Soil PH in the Development of Enhanced Biodegradation of Fenamiphos.” *Applied and Environmental Microbiology* 69(12): 7035–43.
- Smathers, Garrett A., and Mueller-Dombois. Dieter. 1972. *Invasion And Recovery of Vegetation After a Volcanic Eruption In Hawaii*. Hawaii.
- Solfiyeni, Solfiyeni, Chairul Chairul, and Masdalena Marpaung. 2016. “Analisis Vegetasi Tumbuhan Invasif Di Kawasan Cagar Alam Lembah Anai, Sumatera Barat.” *Proceeding Biology Education Conference: Biology, Science, Enviromental, and Learning* 13(1): 743–47.
<https://jurnal.uns.ac.id/prosbi/article/view/5898> (October 10, 2023).
- Soti, Pushpa G, Matthew Purcell, and Krish Jayachandran. 2020. “Soil Biotic and Abiotic Conditions Negate Invasive Species Performance in Native Habitat.” *Ecological Processes* 9(1).
- Souza, Carlos M. et al. 2020. “Reconstructing Three Decades of Land Use and Land Cover Changes in Brazilian Biomes with Landsat Archive and Earth Engine.” *Remote Sensing* 12(17).
- Stackhouse, Leanna A. et al. 2023. “Characterizing Riparian Vegetation and Classifying Riparian Extent Using Airborne Laser Scanning Data.” *Ecological Indicators* 152.
- Stagl, Judith et al. 2014. “Effects of Climate Change on the Hydrological Cycle in Central and Eastern Europe.” *Advances in Global Change Research* 58: 31–43.
- Standard Nasional Indonesia. 2011. *Pengukuran Dan Penghitungan Cadangan Karbon-Pengukuran Lapangan Untuk Penaksiran Cadangan Karbon Hutan (Ground Based Forest Carbon Accounting)*.
- Standards, ASTM. 1998. “ASTM D 2216-98, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.”
- Steenis, C. G. G. J. van, Amir Hamzah, and Moehamad. Toha. 1972. *The Mountain Flora of Java*. Netherlands: Brill.
- Storey, James et al. 2014. “Landsat 8 Operational Land Imager On-Orbit Geometric Calibration and Performance.” *Remote Sensing* 6(11): 11127–52.
- Sulaksono, Nurpana et al. 2022. “Response of Terrestrial Mammals to Various Types of Disturbance in the Gunung Merapi National Park, Indonesia.” *Biodiversitas* 23(3): 1635–47.
- Sulaksono, Nurpana, and Yayan Hadiyan. 2015. “Conflict Resolution Strategy for Ecosystem Problems of Mount Merapi National Park: Some Lesson from Jurang Jero.” *Seminar Nasional Masyarakat Biodiversitas Indonesia* 1(6): 1370–74.
- Sulfiantono, Arif. 2012. “Forest Ecology: Forest Ecosystem in Merapi Volcano National Park, Indonesia.” *Paper Forest Ecology*.
- Supriya Devi, L., and P. S. Yadava. 2009. “Aboveground Biomass and Net Primary Production of Semi-Evergreen Tropical Forest of Manipur, North-Eastern India.”

- Journal of Forestry Research* 20(2): 151–55.
- Suryanto, P, MZ Hamzah, MZ Alias, and A Mohamed. 2010. “Post-Eruption Species Dynamic of Gunung Merapi National Park, Java, Indonesia.” *Journal of Topical Biology and Conservation* 7: 49–57.
- Susilo, H, Z Thomas, W Matthias, and H Keith. 2009. “Tree Diversity and Forest Structure in Northern Siberut, Mentawai Islands, Indonesia - Google Search.” *Tropical Ecology* 50(2): 315–27.
- Sutomo, and Dini Fardila. 2013. “Floristic Composition of Groundcover Vegetation after the 2010 Pyroclastic Fire on Mount Merapi.” *Jurnal Manajemen Hutan Tropika* 19(2): 85–93.
- Sutomo, and Luthfi Wahab. 2019. “Changes in Vegetation on Mount Agung Volcano Bali Indonesia.” *Journal of Tropical Biodiversity and Biotechnology* 4(2): 54–61.
- Tadese, Semegnaw., Teshome. Soromessa, and Tesefaye. Bekele. 2019. “Above Ground Biomass Estimation Methods and Challenges: A Review.” *Journal of Energy Technologies and Policy* 9: 12–25.
- Takayama, Koji, Tetsuo Ohi-Toma, Hiroshi Kudoh, and Hidetoshi Kato. 2005. “Origin and Diversification of Hibiscus Glaber, Species Endemic to the Oceanic Bonin Islands, Revealed by Chloroplast DNA Polymorphism.” *Molecular Ecology* 14(4): 1059–71.
- Tallo. G, R, P, K Wibison, A J Tallo, and F I Kusuma. 2018. “Vegetation Analysis Of Stand Trees Composition of Natural Forest Of Merapi Volcano National Park.” *Journal of Physics: Conference Series* 1114(1): 1–8.
- Tamin, Rike Puspitasari, and Riana Anggraini Anggraini. 2017. “Keanekaragaman Jenis Pohon Pada Tipe Ekosistem Hutan Hujan Tropis Dataran Rendah Di Hutan Kampus Universitas Jambi Mendalo.” *Jurnal Ilmiah Ilmu Terapan Universitas Jambi* 1(1): 85–92.
- Thawaites, RN. 2000. “From Biodiversity to Geodiversity and Soil Diversity. A Spatial Understanding of Soil in Ecological Studies of the Forest Landscape.” *Journal of Tropical Forest Science* 12(2): 388–405.
- Thomas, S. 1990. “Relations between Tree Growth and Geoecological Conditions: Simulation Models of the Growth of Trees in Fields.” *Archiv für Naturschutz und Landschaftsforschung* 30(2): 79–88.
- Torres, Carlos Moreira Miquelino Eleto et al. 2023. “Drivers of Tree Demographic Processes in Forest Fragments of the Brazilian Atlantic Forest.” *Forest Ecology and Management* 534: 1–10.
- Tosiani, A. 2015. *Buku Kegiatan Serapan Dan Emisi Karbon. Direktorat Inventarisasi Dan Pemantauan Sumber Daya Hutan Direktorat Jendral Planologi Kehutanan Dan Tata Lingkungan Kementerian Lingkungan Hidup.*
- Trofimov, V. T. 2009. “Paradoxes of Modern Geoecology.” *Moscow University Geology Bulletin* 64(4): 203–13.
- Tsutsumida, Narumasa, and Alexis J Comber. 2015. “Measures of Spatio-Temporal Accuracy for Time Series Land Cover Data.” *International Journal of Applied Earth Observation and Geoinformation* 41: 46–55.

- Uhlig, David, and Friedhelm von Blanckenburg. 2019. "How Slow Rock Weathering Balances Nutrient Loss during Fast Forest Floor Turnover in Montane, Temperate Forest Ecosystems." *Frontiers in Earth Science* 7.
- Umayana, R., Hardjanto, R. Soekmadi, and S. Sunito. 2020. "Livelihood Adaptation Patterns of Sub Villages Community in the Slope of Merapi Volcano." *IOP Conference Series: Earth and Environmental Science* 528(1): 1–13.
- Undaharta, NKE, and Sutomo. 2016. "Autokologi Begonia Di Sebagian Kawasan Taman Nasional Gunung Merapi." *Jurnal Biologi* 20(1): 29–34.
- Utami, Inggita et al. 2023. "Development of Secondary Forest Succession Based on Estimation of Forest Carbon Stocks Ten Years Post-Merapi Volcano Eruption." *HAYATI Journal of Biosciences* 30(5): 834–42.
- Vachal, J, R Váchalova, Z Vlckova, and J Moravcova. 2006. "Anthropoecological Zoning of Farmland as a Basis for Land Adjustment Design." *Ekologia Bratislava* 25: 145–61.
- Vannoppen, W. et al. 2017. "How Do Root and Soil Characteristics Affect the Erosion-Reducing Potential of Plant Species?" *Ecological Engineering* 109: 186–95.
- Verma, Akash et al. 2021. "Drivers and Mechanisms of Forest Change in the Himalayas." *Global Environmental Change* 68.
- Viera, Márcio, M. V. W. Caldeira, F. F. M. Rovani, and K. C. Castro. 2016. "Ecological and Environmental Aspects of Nutrient Cycling in the Atlantic Forest, Brazil." In *Tropical Forests: The Challenges of Maintaining Ecosystem Services While Managing the Landscape*, eds. J. A Blanco, S Chang, and Y Lo. Croatia: Janeza Trdine, 113–17.
- Wagner, Anne M. et al. 2016. "A Framework for Establishing Restoration Goals for Contaminated Ecosystems." *Integrated Environmental Assessment and Management* 12(2): 264–72.
- Wahyuni, S, D Sisinggih, and I A G Dew. 2021. "Validation of Climate Hazard Group InfraRed Precipitation with Station (CHIRPS) Data in Wonorejo Reservoir, Indonesia." *IOP Conf. Series: Earth and Environmental Science*: 1–9.
- Wahyuningrum, H., L. D. Mahfudz, and R. Muryani. 2022. "Macroclimate at Different Altitudes on Changes in Microclimates in a Closed House." *Science* 17(2).
- Wang, S.Q., X.Q. Zheng, and X.B. Zang. 2012. "Accuracy Assessments of Land Use Change Simulation Based on Markov-Cellular Automata Model." *Procedia Environmental Sciences* 13: 1238–45.
- Wang, Y et al. 2014. "Soil Organic Carbon in Semi-Natural Mixed Larch-Spruce-Fir Stands of Northeastern China." *Pratacultural Sci* 8: 1424–29.
- Wardhana, Wahyu et al. 2020. "A Hybrid Approach of Remote Sensing for Mapping Vegetation Biodiversity in a Tropical Rainforest." *Biodiversitas Journal of Biological Diversity* 21(9): 3946–53.
- Wavrek, Mia T., Sharon Jean-Philippe, and Michael L. McKinney. 2023. "Ecological and Soil Data Applied to Conservation Management of an Urban Forest." *Urban Forestry*: 1–17.
- Whitmore, T. C., and C. P. Burham. 1986. *Tropical Rain Forests of the Far East*. 2nd

- ed. Oxford: Oxford University Press.
- Whitten, A.J., M. Mustafa, and G.S. Henderson. 1987. *Ecology of Sulawesi*. Gadjah Mada University Press, Bulaksumur.
- Wijayati, Dian, and R. Rijanta. 2020. "Evaluasi Zonasi Taman Nasional Gunung Merapi." *Jurnal Litbang Sukowati* 3(2): 92–106.
- Wilkes, Phil et al. 2018. "Estimating Urban above Ground Biomass with Multi-Scale LiDAR." *Carbon Balance and Management* 13(10): 10.
- Williams, C. A. et al. 2014. "Impacts of Disturbance History on Forest Carbon Stocks and Fluxes: Merging Satellite Disturbance Mapping with Forest Inventory Data in a Carbon Cycle Model Framework." *Remote Sensing of Environment* 151: 57–71.
- Wimberly, Michael C., and Janet L. Ohmann. 2004. "A Multi-Scale Assessment of Human and Environmental Constraints on Forest Land Cover Change on the Oregon (USA) Coast Range." *Landscape Ecology* 19(6): 631–46.
- Wu, Po Po et al. 2022. "Vegetation Classification and Distribution Patterns in the South Slope of Yarlung Zangbo Grand Canyon National Nature Reserve, Eastern Himalayas." *Plants* 11(9): 1194.
- Wu, Wenqi et al. 2019. "Performance Evaluation of the CHIRPS Precipitation Dataset and Its Utility in Drought Monitoring over Yunnan Province, China." *Geomatics, Natural Hazards and Risk* 10(1): 2145–62.
- Xu, H., and P. Becker. 2012. "ArcGIS Data Models for Managing and Processing Imagery." *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences XXXIX-B4*: 97–101.
- Yang, Ranran et al. 2021. "Estimation of the Conifer-Broadleaf Ratio in Mixed Forests Based on Time-Series Data." *Remote Sensing 2021, Vol. 13, Page 4426* 13(21): 4426.
- Yao, Yiwen et al. 2021. "Effects of Rainfall Intensity on Runoff and Nutrient Loss of Gently Sloping Farmland in a Karst Area of SW China." *PLoS ONE* 16(3 March).
- Yokobe, Tomohiro, Fujio Hyodo, and Naoko Tokuchi. 2020. "Volcanic Deposits Affect Soil Nitrogen Dynamics and Fungal–Bacterial Dominance in Temperate Forests." *Soil Biology and Biochemistry* 150.
- Young, Nicholas E. et al. 2017. "A Survival Guide to Landsat Preprocessing." *Ecology* 98(4): 920–32.
- Yun-Yi, Zhang, Wei Wu, and Hongbin Liu. 2019. "Factors Affecting Variations of Soil PH in Different Horizons in Hilly Regions." *PLOS ONE* 14(6): e0218563.
- Zaitunah, Anita, Samsuri, and Fauziah Sahara. 2021. "Mapping and Assessment of Vegetation Cover Change and Species Variation in Medan, North Sumatra." *Heliyon* 2 7(7).
- Zazanashvili, N, R Gagnidze, and G Nakhutsrishvili. 2000. "Main Types of Vegetation Zonation on the Mountains of the Caucasus." *Acta Phytogeographica Suecica* 85: 7–16.
- Zhang, B. 1995. "Geoecology and Sustainable Development in the Kunlun Mountains, China." *Mountain Research and Development* 15(3): 283–92.

- Zheng, Shao Jian. 2010. "Crop Production on Acidic Soils: Overcoming Aluminium Toxicity and Phosphorus Deficiency." *Annals of Botany* 106(1): 183–84.
- Zhou, Decheng et al. 2019. "Satellite Remote Sensing of Surface Urban Heat Islands: Progress, Challenges, and Perspectives." *Remote Sensing* 11(1): 74.
- Zolkos, S. G., S. J. Goetz, and R. Dubayah. 2013. "A Meta-Analysis of Terrestrial Aboveground Biomass Estimation Using Lidar Remote Sensing." *Remote Sensing of Environment* 128: 289–98.