

References

- [1] Ministry of Water Supply and Drainage, “National drinking water policy,” Sri Lanka, 2012.
- [2] T. Ahmad, K. Ahmad, and M. Alam, “Sludge quantification at water treatment plant and its management scenario,” *Environ. Monit. Assess.*, vol. 2, no. 189, p. 453, 2017, doi: 10.1007/s10661-017-6166-1.
- [3] G. R. Xu, J. L. Zou, and G. B. Li, “Ceramsite obtained from water and wastewater sludge and its characteristics affected by (Fe₂O₃+CaO+MgO)/(SiO₂+Al₂O₃)”, *Water Res.*, vol. 43, no. 11, pp. 2885–2893, 2009, doi: 10.1016/j.watres.2009.03.046.
- [4] K. Anjithan, “Management practices of water treatment sludge in Sri Lanka,” University of Moratuwa, 2015.
- [5] National Water Supply and Drainage Board, “Sludge Management Policy for Water Treatment Plants,” Sri Lanka, 2012.
- [6] H. H. Galkanda and R. U. Halwatura, “Analysis the Performance of Chemical and Physical Additives to Reduce Shrinkage of Drinking Water Treatment Sludge (DWTS),” *Int. J. Environ. Sci. Dev.*, vol. 11, no. 4, pp. 175–179, 2020, doi: 10.18178/ijesd.2020.11.4.1247.
- [7] A. Ruuska and T. Häkkinen, “Material Efficiency of Building Construction,” *Buildings*, vol. 4, no. 3, pp. 266–294, 2014, doi: 10.3390/buildings4030266.
- [8] S. Hermann, D. Arent, P. Steduto, and R. S. J. Tol, “Considering the energy , water and food nexus : Towards an integrated modelling approach,” *Energy Policy*, 2011, doi: 10.1016/j.enpol.2011.09.039.
- [9] Y. Gong and D. Song, “Life cycle building carbon emissions assessment and driving factors decomposition analysis based on LMDI-A case study of Wuhan city in China,” *Sustain.*, vol. 7, no. 12, pp. 16670–16686, 2015, doi: 10.3390/su71215838.
- [10] J. Park, J. Yoon, and K. H. Kim, “Critical review of the material criteria of building sustainability assessment tools,” *Sustain.*, vol. 9, no. 2, 2017, doi: 10.3390/su9020186.
- [11] A. A. Sofi, T. A. Sheikh, R. A. Wani, and A. Manzoor, “Cement stabilized earth

- blocks (CSEB): An economic and eco- friendly building material .,” *IOSR J. Mech. Civ. Eng.*, vol. 13, no. 6, pp. 6–11, 2016, doi: 10.9790/1684-1306050611.
- [12] C. Udawattha, F. R. Arooz, and R. U. Halwatura, “New earth walling material: Integrating modern technology onto ancient mud wall,” *7th Int. Conf. Sustain. Built Environ.*, vol. 7, no. March 2017, pp. 24–31, 2016.
- [13] M. I. Gomes, P. Faria, and T. D. Gonçalves, “Earth-based mortars for repair and protection of rammed earth walls. Stabilization with mineral binders and fibers,” *J. Clean. Prod.*, vol. 172, no. November, 2017, doi: 10.1016/j.jclepro.2017.11.170.
- [14] J. Krantz, J. Larsson, W. Lu, and T. Olofsson, “Assessing Embodied Energy and Greenhouse Gas Emissions in Infrastructure Projects,” *Buildings*, vol. 5, no. 4, pp. 1156–1170, 2015, doi: 10.3390/buildings5041156.
- [15] E. Quagliarini, A. Stazi, E. Pasqualini, and E. Fratalocchi, “Cob construction in Italy: Some lessons from the past,” *Sustainability*, vol. 2, no. 10, pp. 3291–3308, 2010, doi: 10.3390/su2103291.
- [16] M. S. Lekshmi, S. Vishnudas, and D. G. N. Nair, “Experimental Study on the Physical Properties of Mud Mortar in Comparison with the Conventional Mortars,” *Civ. Eng. Urban Plan. An Int. J.*, vol. 3, no. 2, pp. 127–135, 2016, doi: 10.5121/civej.2016.3211.
- [17] M. Emiroğlu, A. Yalama, and Y. Erdoğdu, “Performance of ready-mixed clay plasters produced with different clay/sand ratios,” *Appl. Clay Sci.*, vol. 115, pp. 221–229, 2015, doi: 10.1016/j.clay.2015.08.005.
- [18] J.K. Cement Limited, “Growth with resilience - Sustainable Report 2015-16,” Uttara Pradesh, India, 2016.
- [19] GMP+ International B.V., “Risk assessment : Calcium carbonate,” The Netherlands, 2015.
- [20] P. Janiszewski, “How long can we survive without food or water?,” 2015.
- [21] A. H. Sequeira, R. Malik, P. Pandey, R. Chandra, and P. Baishya, “Study on Drinking Water Habits of Residents of a Campus: A Case Study.,” *SSRN Electron. J.*, vol. May, pp. 4–28, 2014, doi: 10.2139/ssrn.2392765.
- [22] B. C. O. Kelly, “Geotechnical properties of a municipal water treatment sludge incorporating a coagulant,” *Can. Geotech. J.*, vol. 45, pp. 715–725, 2008, doi:

- 10.1139/T07-109.
- [23] S. De Carvalho, J. L. Zhou, W. Li, and G. Long, “Progress in manufacture and properties of construction materials incorporating water treatment sludge : A review,” *Resour. Conserv. Recycl.*, vol. 145, pp. 148–159, 2019, doi: 10.1016/j.resconrec.2019.02.032.
 - [24] H. Moayedi, B. Huat, A. ASADI, Z. Salleh, and M. Moghaddas, “Surface Water Treatment Process; A Review on Various Methods,” *Electron. J. Geotech. Eng.*, vol. 16, 2011.
 - [25] A. I. Zouboulis and I. A. Katsoyiannis, “Recent Advances in Water and Wastewater Treatment with Emphasis in Membrane Treatment Operations,” *Water*, vol. 11, no. 45, pp. 1–6, 2019, doi: 10.3390/w11010045.
 - [26] M. Farhaoui and M. Derraz, “Review on Optimization of Drinking Water Treatment Process,” *J. Water Resour. Prot.*, vol. 8, pp. 777–786, 2016, doi: 10.4236/jwarp.2016.88063.
 - [27] A. M. Hidalgo, M. D. Murcia, M. G’omez, and E. G’omez, “Possible Uses for Sludge from Drinking Water Treatment Plants,” *J. Environ. Eng.*, vol. 143, no. 04016088, pp. 1–7, 2016, doi: 10.1061/(ASCE)EE.1943-7870.0001176.
 - [28] K. M. Hassan, K. Fukushi, K. Turikuzzaman, and S. M. Moniruzzaman, “Effects of using arsenic – iron sludge wastes in brick making,” *Waste Manag.*, vol. 34, no. 6, pp. 1072–1078, 2014, doi: 10.1016/j.wasman.2013.09.022.
 - [29] S. R. Teixeira, G. T. A. Santos, A. E. Souza, P. Alessio, S. A. Souza, and N. R. Souza, “The effect of incorporation of a Brazilian water treatment plant sludge on the properties of ceramic materials,” *Appl. Clay Sci.*, vol. 53, no. 4, pp. 561–565, 2011, doi: 10.1016/j.clay.2011.05.004.
 - [30] S. E. Hagemann, A. L. G. Gastaldini, M. Cocco, S. L. Jahn, and L. M. Terra, “Synergic effects of the substitution of Portland cement for water treatment plant sludge ash and ground limestone : Technical and economic evaluation,” *J. Clean. Prod.*, vol. 214, pp. 916–926, 2019, doi: 10.1016/j.jclepro.2018.12.324.
 - [31] S. De Carvalho Gomes, J. L. Zhou, W. Li, and G. Long, “Progress in manufacture and properties of construction materials incorporating water treatment sludge: A review,” *Resour. Conserv. Recycl.*, vol. 145, no. February, pp. 148–159, 2019, doi: 10.1016/j.resconrec.2019.02.032.

- [32] C. Huang, J. R. Pan, and Y. Liu, “Mixing Water Treatment Residual with Excavation Waste Soil in Brick and Artificial Aggregate Making,” *J. Environ. Eng.*, vol. 131, no. February, pp. 272–277, 2005.
- [33] National Water Supply and Drainage Board Sri Lanka, “National Water Supply and Drainage Board - Annual Report 2019,” 2019.
- [34] S. Sumanaweera, “Kelani Right Bank Water Treatment Plant Sri Lanka,” 2015. [Online]. Available: <http://www.jwrc-net.or.jp/aswin/en/newtap>
- [35] A. Sales, F. Rodrigues, D. Souza, and C. Rosa, “Mechanical properties of concrete produced with a composite of water treatment sludge and sawdust,” *Constr. Build. Mater.*, vol. 25, no. 6, pp. 2793–2798, 2011, doi: 10.1016/j.conbuildmat.2010.12.057.
- [36] T. Ahmad, K. Ahmad, and M. Alam, “Sustainable management of water treatment sludge through 3‘R’ concept,” *J. Clean. Prod.*, vol. 124, pp. 1–13, 2016, doi: <https://doi.org/10.1016/j.jclepro.2016.02.073>.
- [37] J. Komlos, A. Welker, M. Asce, V. Punzi, R. Traver, and M. Asce, “Feasibility Study of As-Received and Modified (Dried / Baked) Water Treatment Plant Residuals for Use in Storm-Water Control Measures,” *J. Environ. Eng.*, vol. 139, no. 10, pp. 1237–1245, 2013, doi: 10.1061/(ASCE)EE.1943-7870.0000737.
- [38] B. C. O’Kelly and M. E. Quille, “Compressibility and consolidation of water treatment residues,” in *Proceedings of the Institution of Civil Engineers Waste and Resource Management*, 2009, no. 162, pp. 85–97. doi: 10.1680/warm.2009.162.2.85.
- [39] M. C. Wang, J. Q. Hull, M. Jao, B. A. Dempsey, and D. A. Cornwell, “Engineering behavior of water treatment sludge,” *J. Environ. Eng.*, vol. 118, no. 6, pp. 848–864, 1992.
- [40] B. M. C. Wang, J. Q. Hull, M. Jao, B. A. Dempsey, and D. A. Cornwell, “Engineering behavior o f w a t e r treatment sludge,” *J. Environ. Eng.*, vol. 118, pp. 848–864, 1992.
- [41] A. M. Hidalgo, M. D. Murcia, M. Gomez, E. Gomez, C. Garcia-Izquierdo, and C. Solano, “Possible Uses for Sludge from Drinking Water Treatment Plants,” *J. Environ. Eng.*, pp. 1–7, 2016, doi: 10.1061/(ASCE)EE.1943-7870.0001176.

- [42] Y.-E. Lee, I.-T. Kim, and Y.-S. Yoo, “Stabilization of High-Organic-Content Water Treatment Sludge by Pyrolysis,” *Energies*, vol. 11, no. 3929, pp. 1–14, 2018, doi: 10.3390/en11123292.
- [43] E. Nimwinya, W. Arjharn, and S. Horpibulsuk, “A sustainable calcined water treatment sludge and rice husk ash geopolymer,” *J. Clean. Prod.*, vol. 119, pp. 128–134, 2016, doi: 10.1016/j.jclepro.2016.01.060.
- [44] S. Horpibulsuk, C. Suksiripattanapong, W. Samingthong, R. Rachan, and A. Arulrajah, “Durability against Wetting – Drying Cycles of Water Treatment Sludge – Fly Ash Geopolymer and Water Treatment Sludge – Cement and Silty Clay – Cement Systems,” *J. Mater. Civ. Eng.*, pp. 1–9, 2015, doi: 10.1061/(ASCE)MT.1943-5533.0001351.
- [45] P. Verlicchi and L. Masotti, “reuse of drinking water treatment plants sludges in agriculture: problems, perspectives and limitations,” in *Technology transfer. Proceedings of the 9th International Conference on the FAO ESCORENA Network on recycling of agricultural, municipal and industrial residues in agriculture, Gargano, Italy*, 2001, pp. 67–73.
- [46] K. Chiang, P. Chou, C. Hua, K. Chien, and C. Cheeseman, “Lightweight bricks manufactured from water treatment sludge and rice husks,” *J. Hazard. Mater. J.*, vol. 171, pp. 76–82, 2009, doi: 10.1016/j.jhazmat.2009.05.144.
- [47] K. Lin and C. Lin, “Hydration characteristics of waste sludge ash utilized as raw cement material,” *Cem. Concr. Res.*, vol. 35, no. 2005, pp. 1999–2007, 2005, doi: 10.1016/j.cemconres.2005.06.008.
- [48] Y. Lee, S. Lo, J. Kuo, and C.-C. Tsai, “Beneficial Uses of Sludge from Water Purification Plants in Concrete Mix,” *Environ. Eng. Sci.*, vol. 29, no. 4, pp. 284–289, 2012, doi: 10.1089/ees.2010.0479.
- [49] R. M. R. Zamora, F. E. Ayala, L. C. Garcia, A. D. Moreno, and R. Schouwenaars, “Optimization of the preparation conditions of ceramic products using drinking water treatment sludges,” *J. of Environmental Sci. Heal. Part A Toxic/Hazardous Subst. Environ. Eng.*, vol. 43, pp. 1562–1568, 2008, doi: 10.1080/10934520802293750.
- [50] L. V. Cremades, J. A. Cusido, and F. Arteaga, “Recycling of sludge from drinking water treatment as ceramic material for the manufacture of tiles,” *J.*

Clean. Prod., vol. 201, pp. 1071–1080, 2018, doi: 10.1016/j.jclepro.2018.08.094.

- [51] A. O. Babatunde and Y. Q. Zhao, “Constructive Approaches Toward Water Treatment Works Sludge Management : An International Review of Beneficial Reuses,” *Crit. Rev. Environ. Sci. Technol.*, vol. 37, no. 2, pp. 129–164, 2007, doi: 10.1080/10643380600776239.
- [52] F. R. Arooz and R. U. Halwatura, “Mud-concrete block (MCB): mix design & durability characteristics,” *Case Stud. Constr. Mater.*, vol. 8, no. December 2017, pp. 39–50, 2018, doi: 10.1016/j.cscm.2017.12.004.
- [53] C. Udawattha and R. Halwatura, “Embodied energy of mud concrete block (MCB) versus brick and cement blocks,” *Energy Build.*, vol. 126, pp. 28–35, 2016, doi: 10.1016/j.enbuild.2016.04.059.
- [54] K. G. Ramirez, E. Possan, B. G. dos Santos Dezen, and M. Colombo, “Potential uses of waste sludge in concrete production,” *Manag. Environ. Qual. An Int. Journa*, vol. 28, no. 6, pp. 821–838, 2017, doi: 10.1108/MEQ-09-2015-0178.
- [55] P. Ponkarthikeyan, R. Ganesh, S. F. A, and A. Clay, “Experimental Study on Bricks Using Water Treatment Sludge,” *Int. J. Res. Appl. Sci. Eng. Technol.*, vol. 4, no. Xi, pp. 485–493, 2016.
- [56] E. M. M. Ewais, R. M. Elsaadany, A. A. Ahmed, and N. H. Shalaby, “INSULATING REFRACTORY BRICKS FROM WATER TREATMENT SLUDGE AND RICE HUSK ASH,” *Refract. Ind. Ceram.*, vol. 58, no. 2, pp. 136–144, 2017, doi: 10.1007/s11148-017-0071-6.
- [57] E. M. Silva, D. M. Morita, A. C. M. Lima, and L. G. Teixeira, “Manufacturing ceramic bricks with polyaluminum chloride (PAC) sludge from a water treatment plant,” *Water Sci. Technol.*, vol. 71, no. 11, pp. 1638–1645, 2015, doi: 10.2166/wst.2015.132.
- [58] M. Dahhou, M. El, M. Muhammad, and A. Arshad, “Synthesis and characterization of drinking water treatment plant sludge - incorporated Portland cement,” *J. Mater. Cycles Waste Manag.*, 2017, doi: 10.1007/s10163-017-0650-0.
- [59] M. Alqam, A. Jamrah, and H. Daglas, “Utilization of Cement Incorporated with Water Treatment Sludge,” *Jordan J. Civ. Eng.*, vol. 5, no. 2, pp. 268–277,

2011.

- [60] J. Byrne, “G REEN B UILDINGS IN D ELAWARE ;,” no. September, 2008.
- [61] C. Udawattha and R. Halwatura, “Life cycle cost of different Walling material used for affordable housing in tropics,” *Case Stud. Constr. Mater.*, vol. 7, no. April, pp. 15–29, 2017, doi: 10.1016/j.cscm.2017.04.005.
- [62] C. Udawattha, H. Galkanda, I. S. Ariyarathne, G. Y. Jayasinghe, and R. Halwatura, “Mold growth and moss growth on tropical walls,” *Build. Environ.*, vol. 137, no. January, pp. 268–279, 2018, doi: 10.1016/j.buildenv.2018.04.018.
- [63] R. Dissanayake, “GREEN BUILDINGS FOR SUSTAINABLE BUILT ENVIRONMENT IN SRI LANKA,” no. Id, pp. 1–7, 2015.
- [64] M. Rana, S. Azad, A. H. Akhi, G. Sharfaraz, and I. Azad, “Effect of Environmental Impact in Building Constructions,” vol. 5, no. 6, pp. 339–343, 2017, doi: 10.11648/j.ajce.20170506.14.
- [65] U. A. Umar, D. Adaptive, M. Customization, and F. Building, “sustainable building material for green building construction , sustainable building material for green building construction , conservation and refurbishing,” no. December, 2012.
- [66] R. Rahardjati, M. F. Khamidi, and A. Idrus, “Green building rating system : The need of material resources criteria in green building assessment,” in *2011 2nd International Conference on Environmental Science and Technology*, 2011, no. February 2011.
- [67] W. Fei *et al.*, “The critical role of the construction industry in achieving the sustainable development goals (Sdgs): Delivering projects for the common good,” *Sustainability*, vol. 13, no. 9112, 2021, doi: 10.3390/su13169112.
- [68] S. Goubran, “On the Role of Construction in Achieving the SDGs,” *J. Sustain. Res.*, vol. 1, no. 2, 2019, doi: 10.20900/jsr20190020.
- [69] E. M. Elias and C. Khai, “The empirical study of green buildings (residential) implementation : perspective of house developers,” *Procedia Environ. Sci.*, vol. 28, no. SustaiN 2014, pp. 708–716, 2015, doi: 10.1016/j.proenv.2015.07.083.
- [70] J. Zuo and Z. Zhao, “Green building research – current status and future agenda : A review Green building research – current status and future agenda : A review,” *Renew. Sustain. Energy Rev.*, vol. 30, no. February 2014, pp. 271–

- 281, 2018, doi: 10.1016/j.rser.2013.10.021.
- [71] Brick Industry Association, “Sustainability and Brick, Technical Notes on Brick Construction,” *Brick Ind. Assoc.*, vol. 48, no. November, pp. 1–10, 2015.
 - [72] S. A. A. Gunawardana, S. A. D. S. S. Maheepala, and G. Y. Jayasinghe, “Current Status, Requirements and Opportunities for Green Building in Sri Lanka,” *Int. For. Environ. Symp.* 2017, no. 73, p. 2017, 2017.
 - [73] B. A. W. P. Bombugala and A. Atputharajah, “Sustainable development through green building concept,” in *International Conference on Sustainable Built Environment-2010*, 2010, no. December 2010, pp. 13–14.
 - [74] K. G. A. S. Waidyasekara and W. N. J. K. Fernando, “benefits of adopting green concept for,” 2013.
 - [75] F. R. Arooz and R. U. Halwatura, “Case Studies in Construction Materials Mud-concrete block (MCB): mix design & durability characteristics,” *Case Stud. Constr. Mater.*, vol. 8, no. November 2017, pp. 39–50, 2018, doi: 10.1016/j.cscm.2017.12.004.
 - [76] C. Jayasinghe, “Embodied energy of alternative building materials and their impact on life cycle cost parameters,” 2011.
 - [77] J. M. Crow, “The concrete conundrum,” *Chem. World*, no. March, pp. 62–66, 2008.
 - [78] World Business Council for Sustainable Development, “The cement sustainability initiative progress report 2005,” *Corp. Soc. Responsib. Environ. Manag.*, vol. 11, no. 2, 2005, doi: 10.1002/csr.59.
 - [79] C. Meyer, “Concrete Materials and Sustainable Development in the USA,” *Struct. Eng. Int.*, vol. 14, no. 3, pp. 203–207, 2004, doi: 10.2749/101686604777963757.
 - [80] C. Udawattha, F. R. Arooz, and R. U. Halwatura, “Energy content of walling materials- A comparison of Mud-Concrete Blocks, Bricks, Cabook and Cement Blocks on tropics,” *7th Int. Conf. Sustain. Built Environ.*, vol. 7, no. December, pp. 30–42, 2016.
 - [81] N. H. V. T. N. Nanayakkara, C. Udawattha, and R. Halwatura, “Investigation on Elements and their Fraction of Building Construction Cost,” *Moratuwa Eng. Res. Conf.*, pp. 277–282, 2017.

- [82] R. U. Halwatura and N. M. Nishad, “Effects of greenery on city comfort in different micro climatic conditions,” 2013.
- [83] British Standard Institution, “Durability of buildings and building elements , products and components,” London, 1992.
- [84] C. D. Udawattha, G. A. H. H. Galkanda, and R. U. Halwatura, “A Study on Natural Rain Surface Erosion of Different Walling Materials in Tropics,” *2018 Moratuwa Eng. Res. Conf.*, no. i, pp. 84–89, 2018, doi: 10.1109/MERCon.2018.8421938.
- [85] H. Galkanda, C. Udawattha, and R. Halwatura, “Improve intrinsic properties of walling materials to create occupant comfort,” in “*Sustainability for people - envisaging multi disciplinary solution*”: *Proceedings of the 11th International Conference of Faculty of Architecture Research Unit (FARU)*, 2018, pp. 66–73.
- [86] S. A. A. Gunawardana, H. H. Galkanda, R. U. Halwatura, and G. Y. Jayasinghe, “Investigation of rain surface erosion and bonding strength of different wall care putty materials along with different walling materials,” *J. Build. Eng.*, vol. 34, no. September 2020, p. 101872, 2021, doi: 10.1016/j.jobe.2020.101872.
- [87] A. N. Askar and L. P. Raut, “International journal of engineering sciences & research technology design of automatic wall plastering machine,” *Int. J. Eng. Sci. Res. Technol. Des.*, vol. 6, no. 3, pp. 543–555, 2017.
- [88] M. M. Saleh, “characterization of qarh’s wall plasters, al-ulla, saudi arabia. A case study,” *Int. J. Conserv. Sci.*, vol. 4, no. 1, pp. 65–80, 2013.
- [89] N. Zainudeen and J. Jeyamathn, “Cement and its effect to the environment : A case study in SriLanka,” *Dep. Build. Econ. Univ. Moratuwa*, pp. 1408–1416, 2004.
- [90] K. S. Devi, V. V Lakshmi, and A. Alakanandana, “Impacts of Cement Industry on Environment - An Overview impacts of cement industry on environment – an overview,” *Asia pacific J. Res.*, vol. 1, no. 157, 2018.
- [91] M. Stajanca and A. Estokova, “Environmental Impacts of Cement Production,” *Tech. Univ. Kosice, Civ. Eng. Fac. Inst. Archit. Eng.*, pp. 296–302, 2012.
- [92] R. U. K. Piyadasa, “River sand mining and associated environmental problems in Sri Lanka,” in *River sand mining and associated environmental problems in Sri Lanka*, 2011, no. September 2009, pp. 148–153.

- [93] M. P. Gray, “Cave Art and the Evolution of the Human Mind,” Victoria University of Wellington, 2010.
- [94] R. J. Forbes, *Studies in Ancient Technology - Volume I*. Leiden, The Netherlands: E.J. Brill, 1955.
- [95] M. Singh, S. Vinodh Kumar, and S. Waghmare, “Mud Plaster Wall Paintings of Bhaja Caves: Composition and Performance Characteristics,” *Indian J. Hist. Sci.*, vol. 51, no. 3, pp. 431–442, 2016, doi: 10.16943/ijhs/2016/v51i3/48846.
- [96] G. Browne, “stabilised interlocking rammed earth blocks: alternatives to cement stabilisation.” Southampton Solent University, 2009.
- [97] S. Fang, H. Zhang, B. Zhang, and G. Li, “A study of Tung-oil-lime putty - A traditional lime based mortar,” *Int. J. Adhes. Adhes.*, vol. 48, pp. 224–230, 2014, doi: 10.1016/j.ijadhadh.2013.09.034.
- [98] P. Zhao, M. D. Jackson, Y. Zhang, G. Li, P. J. M. Monteiro, and L. Yang, “Material characteristics of ancient Chinese lime binder and experimental reproductions with organic admixtures,” *Constr. Build. Mater.*, vol. 84, pp. 477–488, 2015, doi: 10.1016/j.conbuildmat.2015.03.065.
- [99] S. Fang, H. Zhang, B. Zhang, and G. Li, “A study of Tung-oil-lime putty - A traditional lime based mortar,” *Int. J. Adhes. Adhes.*, vol. 48, pp. 224–230, 2014, doi: 10.1016/j.ijadhadh.2013.09.034.
- [100] S. Fang, K. Zhang, H. Zhang, and B. Zhang, “A study of traditional blood lime mortar for restoration of ancient buildings,” *Cem. Concr. Res.*, vol. 76, pp. 232–241, 2015, doi: 10.1016/j.cemconres.2015.06.006.
- [101] J. N. Cooray, *The Sigiriya Royal Gardens; Analysis of the Landscape Architectonic Composition*, vol. 2012, no. 06. 2012. doi: 10.7480/a+be.vol2.diss6.
- [102] D. B. Dhanapala, “A short note on the Technique of the Sigiriya Pictures,” 2015.
- [103] M. Ranaweera and H. Abeyruwan, “Materials Used in the Construction , Conservation , and Restoration of Ancient Stupas in Sri Lanka,” pp. 2573–2586, 2004.
- [104] E. Navrátilová, E. Tihlaříková, V. Neděla, P. Rovnaníková, and J. Pavlík, “Effect of the preparation of lime putties on their properties,” 2017. doi: 10.1038/s41598-017-17527-3.

- [105] S. Holmes and B. Rowan, "Lime Stabilized Construction, A Manual and Practical Guide." IOM, Pakistan, 2015.
- [106] C. Weddikkara and K. Devapriya, "Demand and Supply Trends and Construction Industry Development: A Case Study in the Sri Lankan Construction Industry," *Aust. J. Constr. Econ. Build.*, vol. 1, no. 1, pp. 91–105, 2001, doi: <http://dx.doi.org/10.5130/AJCEB.v1i1.2283>.
- [107] A. Windapo, "Examining The Trends In Building Material Prices : Built Environment Stakeholders ' Perspectives," *Univ. Cape Town, South Africa Abstr.*, vol. 3, no. 2, pp. 187–201, 2012.
- [108] G. Zhang, L. Mo, J. Sun, J. Chen, and J. Liu, "Preparation and Experimental Study on a New Type of Exterior Wall Putty," *Adv. Mater. Res.*, vol. 671–674, pp. 1914–1917, 2013, doi: 10.4028/www.scientific.net/AMR.671-674.1914.
- [109] E. Navrátilová, E. Tihlaříková, V. Neděla, P. Rovnaníková, and J. Pavlík, "Effect of the preparation of lime putties on their properties OPEN," 2017. doi: 10.1038/s41598-017-17527-3.
- [110] C. Udawattha and R. Halwatura, "Embodied Energy of Mud Concrete Block (MCB) Versus Brick and Cement Blocks," *Energy Build.*, vol. 126, no. May, pp. 28–35, 2016, doi: 10.1016/j.enbuild.2016.04.059.
- [111] P. Melià, G. Ruggieri, S. Sabbadini, and G. Dotelli, "Environmental impacts of natural and conventional building materials: A case study on earth plasters," *J. Clean. Prod.*, vol. 80, pp. 179–186, 2014, doi: 10.1016/j.jclepro.2014.05.073.
- [112] O. Ruskulis, "Mud Plasters and Renders," *Appropriate Technology*, vol. 26, no. 1, Burnham, United Kingdom, Jun. 1999.
- [113] M. Emiroglu, A. Yalama, and Y. Erdogan, "Performance of ready-mixed clay plasters produced with different clay / sand ratios," *Appl. Clay Sci.*, vol. 115, pp. 221–229, 2015, doi: 10.1016/j.clay.2015.08.005.
- [114] R. Deliniere, J. E. Aubert, F. Rojat, and M. Gasc-Barbier, "Physical , mineralogical and mechanical characterization of ready-mixed clay plaster," *Build. Environ.*, vol. 80, pp. 11–17, 2014, doi: 10.1016/j.buildenv.2014.05.012.
- [115] T. Santos, L. Nunes, and P. Faria, "Production of eco-efficient earth-based plasters: influence of composition on physical performance and bio-susceptibility," *J. Clean. Prod.*, vol. 167, pp. 55–67, 2017, doi:

10.1016/j.jclepro.2017.08.131.

- [116] R. Garcia and P. Prabhakar, “Bond interface design for single lap joints using polymeric additive manufacturing,” *Compos. Struct.*, vol. 176, no. September, pp. 547–555, 2017, doi: 10.1016/j.compstruct.2017.05.060.
- [117] M. S. Lekshmi, S. Vishnudas, and D. G. Nair, “experimental study on the physical properties of mud mortar in comparison with the conventional mortars,” *Int. J. Civ. Eng. Urban Plan.*, vol. 3, no. 2, pp. 127–135, 2016, doi: 10.5121/civej.2016.3211.
- [118] G. Frohnsdorff, L. W. Masters, and J. W. Martin, “An Approach to Improved Durability Tests for Building Materials and Components,” in *An Approach to Improved Durability Tests for Building Materials and Components*, 1980, pp. 1–35.
- [119] A. G. Kerali and T. H. Thomas, “Simple durability test for cement stabilized blocks,” *Build. Res. Inf.*, vol. 32, no. 2, pp. 140–145, 2004, doi: 10.1080/0961321032000148479.
- [120] G. A. H. H. Galkanda, S. A. A. Gunawardana, and R. U. Halwathura, “Analysis of the Performance of Existing Wall Finishers to Enhance the Durability of Different Walling Materials Against Rain Surface Erosion,” *MERCon 2019 - Proceedings, 5th Int. Multidiscip. Moratuwa Eng. Res. Conf.*, pp. 400–405, 2019, doi: 10.1109/MERCon.2019.8818875.
- [121] M. Kameni and J. A. Orosa, “Case Studies in Thermal Engineering Building construction materials effect in tropical wet and cold climates : A case study of office buildings in Cameroon,” *Case Stud. Therm. Eng.*, vol. 7, pp. 55–65, 2016, doi: 10.1016/j.csite.2016.01.007.
- [122] F. Wagner *et al.*, “Pan-tropical analysis of climate effects on seasonal tree growth,” *PLoS One*, vol. 9, no. 3, pp. 20–22, 2014, doi: 10.1371/journal.pone.0092337.
- [123] X. Zhou, Y. Fu, L. Zhou, B. Li, and Y. Luo, “An imperative need for global change research in tropical forests,” *Tree Physiol.*, vol. 33, no. 9, pp. 903–912, 2013, doi: 10.1093/treephys/tpt064.
- [124] G. A. H. H. Galkanda, C. Udawattha, G. Y. Jayasinghe, and R. U. Halwatura, “Comparative study of fungal and moss growth effect on different walling

- materials in tropics,” in *3rd Wayamba International Conference (WinC- 2018)*, 2018, p. 30.
- [125] O. Guillitte, “Bioreceptivity: a new concept for building ecology studies,” *Sci. Total Environ.*, vol. 167, no. 1–3, pp. 215–220, 1995, doi: 10.1016/0048-9697.
- [126] M. D’Orazio *et al.*, “Effects of water absorption and surface roughness on the bioreceptivity of ETICS compared to clay bricks,” *Build. Environ.*, vol. 77, pp. 20–28, 2014, doi: 10.1016/j.buildenv.2014.03.018.
- [127] A. M. Pranjic, J. Mulec, T. Muck, A. Hlandnik, and A. Mladenovic, “The bioreceptivity of building stone,” *Geophys. Res. Abstr.*, vol. 17, 2015.
- [128] C. P. Hoang, K. A. Kinney, R. L. Corsi, and P. J. Szaniszlo, “International Biodeterioration & Biodegradation Resistance of green building materials to fungal growth,” *Int. Biodeterior. Biodegradation*, vol. 64, no. 2, pp. 104–113, 2010, doi: 10.1016/j.ibiod.2009.11.001.
- [129] N. Karagiannis, M. Karoglou, A. Bakolas, and A. Moropoulou, “Building Materials Capillary Rise Coefficient: Concepts, Determination and Parameters Involved,” in *New Approaches to Building Pathology and Durability*, vol. 6, J. Delgoda, Ed. Singapore: Springer, 2016, pp. 27–44. doi: 10.1007/978-981-10-0648-7.
- [130] D. E. James and J. E. Kylander, *Techniques for Studying Bacteria and Fungi*, 8th editio. Carolina: Carolina Biological Supply Company, 1986.
- [131] Mycological Society of Japan, “Introduction to the World of Fungi,” *Polymers (Basel).*, p. 466, 2015.
- [132] H. Viitanen *et al.*, “Moisture and biodeterioration risk of building materials and structures,” *J. Build. Phys.*, vol. 33, no. 3, pp. 201–224, 2010, doi: 10.1177/1744259109343511.
- [133] M. Safiuddin, “Concrete Damage in Field Conditions and Protective Sealer and Coating Systems,” *Coatings*, vol. 7, no. 90, pp. 1–22, 2017, doi: 10.3390/coatings7070090.
- [134] S. T. Methods, “Standard Test Methods for Physical Testing of Quicklime , Hydrated Lime , and,” vol. i, 2016, doi: 10.1520/C0110-15E01.2.
- [135] ASTM International, *ASTM C110-15, Standard Test Methods for Physical Testing of Quicklime , Hydrated Lime , and Limestone*. West Conshohocken,

2016. doi: 10.1520/C0110-15E01.
- [136] G. A. H. H. Galkanda and R. U. Halwatura, “feasibility of incorporating biyagama drinking water treatment plant solid sludge in a construction material production process,” in *9TH YSF Symposium*, 2020, no. November, pp. 37–41.
 - [137] C. Polakowski, M. Ryżak, A. Sochan, M. Beczek, R. Mazur, and A. Bieganowski, “Particle size distribution of various soil materials measured by laser diffraction—the problem of reproducibility,” *Minerals*, vol. 11, no. 5, 2021, doi: 10.3390/min11050465.
 - [138] J. R. Rosell, L. Haurie, A. Navarro, and I. R. Cantalapiedra, “Influence of the traditional slaking process on the lime putty characteristics,” *Constr. Build. Mater.*, vol. 55, pp. 423–430, 2014, doi: 10.1016/j.conbuildmat.2014.01.007.
 - [139] F. A. De Andrade, H. A. Al-qureshi, and D. Hotza, “Measuring and Modeling the Plasticity of Clays,” *Mater. Res.*, vol. 13, no. 3, pp. 395–399, 2010.
 - [140] M. Dahhou, M. El Moussaouiti, A. Benlalla, A. El Hamidi, M. Taibi, and M. A. Arshad, “Structural Aspects and Thermal Degradation Kinetics of Water Treatment Plant Sludge of Moroccan Capital,” *Waste and Biomass Valorization*, 2016, doi: 10.1007/s12649-016-9513-5.
 - [141] E. Nimwinya, W. Arjharn, and S. Horpibulsuk, “A sustainable calcined water treatment sludge and rice husk ash geopolymer,” *J. Clean. Prod.*, vol. 119, pp. 128–134, 2016, doi: 10.1016/j.jclepro.2016.01.060.
 - [142] A. L. G. Gastaldini, M. F. Hengen, M. C. C. Gastaldini, F. D. Amaral, M. B. Antolini, and T. Coletto, “The use of water treatment plant sludge ash as a mineral addition,” *Constr. Build. Mater.*, vol. 94, pp. 513–520, 2015, doi: 10.1016/j.conbuildmat.2015.07.038.
 - [143] B. E. E. Hegazy, H. A. Fouad, and A. M. Hassanain, “Brick Manufacturing From Water Treatment Sludge And Rice Husk Ash,” *Aust. J. Basic Appl. Sci.*, vol. 6, no. 3, pp. 453–461, 2012.
 - [144] N. H. Rodríguez *et al.*, “Re-use of drinking water treatment plant (DWTP) sludge: Characterization and technological behaviour of cement mortars with atomized sludge additions,” *Cem. Concr. Res.*, vol. 40, pp. 778–786, 2010, doi: 10.1016/j.cemconres.2009.11.012.
 - [145] R. A. Wuana and F. E. Okieimen, “Heavy Metals in Contaminated Soils : A

- Review of Sources , Chemistry , Risks and Best Available Strategies for Remediation,” *ISRN Ecol.*, 2011, doi: 10.5402/2011/402647.
- [146] T. A. Adagunodo, L. A. Sunmonu, and M. E. Emetere, “Data in Brief Heavy metals ’ data in soils for agricultural activities,” *Data Br.*, vol. 18, pp. 1847–1855, 2018, doi: 10.1016/j.dib.2018.04.115.
- [147] J. Ogilo, O. Anam, and A. O. Yusuf, “Assessment of Levels of Heavy Metals in Paints from Interior Walls and Indoor Dust from Residential Houses in Nairobi City County , Kenya,” *Chem. Sci. Int. J.*, vol. 21, no. 1, pp. 1–7, 2017, doi: 10.9734/CSJI/2017/37392.
- [148] O. Joseph, E. Emmanuel, and Y. Perrodin, “Ecological risk assessment of heavy metals in paint manufacturing effluents,” in *Conference*, 2005, no. June 2014.
- [149] C. Huang, J. R. Pan, K. Sun, and C. Liaw, “Reuse of water treatment plant sludge and dam sediment in brick-making,” *Water Sci. Technol.*, vol. 44, no. 10, pp. 273–277, 2001.
- [150] G. XU, J. ZOU, and G. LI, “Ceramsite Made with Water and Wastewater Sludge and its Characteristics Affected by SiO₂ and Al₂O₃,” *Environ. Sci. Technol.*, vol. 42, no. 19, pp. 7417–7423, 2008.
- [151] H. Chen, X. Ma, and H. Dai, “Reuse of water purification sludge as raw material in cement production,” *Cem. Concr. Compos.*, vol. 32, no. 6, pp. 436–439, 2010, doi: 10.1016/j.cemconcomp.2010.02.009.
- [152] N. Waijarean, S. Asavapisit, and K. Sombatsompop, “Strength and microstructure of water treatment residue-based geopolymers containing heavy metals,” *Constr. Build. Mater.*, vol. 50, pp. 486–491, 2014, doi: 10.1016/j.conbuildmat.2013.08.047.
- [153] H. M. Owaid, R. Hamid, and M. R. Taha, “Influence of thermally activated alum sludge ash on the engineering properties of multiple-blended binders concretes,” *Constr. Build. Mater.*, vol. 61, pp. 216–229, 2014, doi: 10.1016/j.conbuildmat.2014.03.014.
- [154] P. Wang and D. Liu, “Physical and Chemical Properties of Sintering Red Mud and Bayer Red Mud and the Implications for Beneficial Utilization,” *Materials (Basel).*, vol. 5, pp. 1800–1810, 2012, doi: 10.3390/ma5101800.
- [155] Y. Gapak, G. Das, U. Yerramshetty, and T. V. Bharat, “Laboratory

- determination of volumetric shrinkage behavior of bentonites: A critical appraisal," *Appl. Clay Sci.*, 2016, doi: 10.1016/j.clay.2016.10.038.
- [156] A. Sales, F. Rodrigues, D. Souza, W. Nunes, A. Mendes, and C. Rosa, "Lightweight composite concrete produced with water treatment sludge and sawdust: Thermal properties and potential application," *Constr. Build. Mater.*, vol. 24, no. 12, pp. 2446–2453, 2010, doi: 10.1016/j.conbuildmat.2010.06.012.
- [157] P.-C. Aïtcin and R. J. Flatt, *Science and Technology of Concrete Admixtures*. Elsevier, 2016.
- [158] T. C. Fu, W. Yeih, J. J. Chang, and R. Huang, "The Influence of Aggregate Size and Binder Material on the Properties of Pervious Concrete," *Adv. Mater. Sci. Eng. Vol.*, vol. 2014, pp. 1–17, 2014.
- [159] S. S. Kamath, D. Sampathkumar, and B. Bennehalli, "A review on natural areca fibre reinforced polymer composite materials," *Ciência Tecnol. dos Mater.*, vol. 29, no. 3, pp. 106–128, 2017
- [160] A. Lotfi, H. Li, D. V. Dao, and G. Prusty, "Natural fiber-reinforced composites: A review on material, manufacturing, and machinability," *J. Thermoplast. Compos. Mater.*, vol. 34, no. 2, pp. 238–284, 2019
- [161] M. Ali, A. Liu, H. Sou, and N. Chouw, "Mechanical and dynamic properties of coconut fibre reinforced concrete," *Constr. Build. Mater.*, vol. 30, pp. 814–825, 2012, doi: 10.1016/j.conbuildmat.2011.12.068.
- [162] F. McGonigle and P. A. Ciullo, "Paints & Coatings," in *industrial minerals and their uses*, Noyes Publication, USA, 1996, pp. 99–159.
- [163] S. R. Branch and Y. Branch, "Synthesis and Characterization of Styrene-Acrylic Binders and Their Application on Pigment Printing of Cotton and Polyester Textile Fabrics," *Asian J. Chem.*, vol. 21, no. 6, pp. 4871–4880, 2009.
- [164] C. Udawattha, D. E. De Silva, H. Galkanda, and R. Halwatura, "Performance of natural polymers for Stabilizing earth blocks," *Materialia*, vol. 2, no. August, pp. 23–32, 2018, doi: 10.1016/J.MTLA.2018.07.019.
- [165] H. Galkanda, H. Galabada, D. Dhammadika.P, M. Malsha, N. Renuka, and H. Rangika, "Enhance Biyagama water treatment plant sludge properties with natural and synthetic binders," pp. 0–4, 2020.
- [166] K. V. Ramana and A. J. S. Raju, "Traditional and commercial uses of Litsea

- glutinosa (Lour .) C . B . Robinson (Lauraceae),” *ournal Med. Plants Stud.*, vol. 5, no. 3, pp. 89–91, 2017.
- [167] L. C. B. Rob, N. T. Hien, T. D. Thang, D. N. Dai, and T. H. Thai, “Chemical composition of the leaf oil of Litsea glutinosa,” *VNU J. Sci. Nat. Sci. Technol.*, vol. 26, pp. 161–164, 2010.
- [168] S. A. A. Gunawardanaa, G. A. H. H. Galkanda, and R. U. Halwatura, “Investigation of Fungus Growth and Moss Growth on Different Wall Care Putty Materials along with Different Walling Materials,” *MERCon 2020 - 6th Int. Multidiscip. Moratuwa Eng. Res. Conf. Proc.*, pp. 96–101, 2020.
- [169] S. N. Araya, M. Meding, and A. A. Berhe, “Thermal alteration of soil physico-chemical properties : a systematic study to infer response of Sierra Nevada climosequence soils to forest fires,” *SOIL*, vol. 2, pp. 351–366, 2016.
- [170] G. A. H. H. Galkanda and R. U. Halwatura, “Thermal alteration of water treatment plant alum sludge : a systematic study of Biyagama water treatment plant alum sludge,” 2020.
- [171] C. E. Boyd, “Aluminum Sulfate (Alum) for Precipitating Clay Turbidity from Fish Ponds,” *Trans. Am. Fish. Soc.*, vol. 108, pp. 307–313, 1979.
- [172] C. Fewins, “The Pros and Cons of Different Construction Systems,” pp. 1–11, 2006.
- [173] V. Vliet, “Shear tests on masonry panels ; Literature survey and proposal for experiments,” *Test*, 2004.
- [174] K. Uehara and M. Sakurai, “Bonding strength of adhesives and surface roughness of joined parts,” *J. Mater. Process. Technol.*, vol. 127, no. 2, pp. 178–181, 2002.
- [175] B. Istegeun and E. Celebi, “Triplet Shear Tests on Retrofitted Brickwork Masonry Walls,” vol. 11, no. 9, pp. 1250–1255, 2017.
- [176] T. Tachibana *et al.*, “Cell membrane perforation with photosensitizer and a brushshaped soft-polymer sheet using a malignant glioma cell line,” *Anticancer Res.*, vol. 35, no. 11, pp. 6069–6074, 2015.
- [177] M. Derikvand and H. Pangh, “A modified method for shear strength measurement of adhesive bonds in solid wood,” *BioResources*, vol. 11, no. 1, pp. 354–364, 2016.