PUBLICATIONS

Publications in Refereed Journals:

1. Vadavadagi, S.S., and **Chawla, S.* (2024).** Prediction and validation of geogrid tensile force distribution in back-to-back MSE walls under rail axle load: Finite-Element and Intelligent techniques, **Environmental Earth Sciences**, **(I.F. 2.727), Q2.**

2. Srivastav, S., **Chawla, S.*,** and Mishra, S. **(2024).** Numerical analysis of moving train induced vibration effect on tunnel, surrounding ground and structure, **Earthquake Engineering and Engineering Vibration, Springer, (I.F. 2.727), Q2.**

3. Chawla A., Sarkar k., Abhishek R., **Chawla S.*** Pasupuleti S and Mishra S **(2023).** "A geotechnical approach to compare different slope stabilization techniques for failed slope in the Darjeeling hills, India", **Environmental Earth Sciences**, 82:376, https://doi.org/10.1007/s12665-023-11054-3

4. Banerjee, L, **Chawla, S*** and Dash, S.K **(2023).** Investigations on cyclic loading behavior of geocell stabilized tracks with coal overburden refuse recycled as subballast material, **Transportation Geotechnics**, Elsevier, https://doi.org/10.1016/j.trgeo.2023.100969. **(I.F.-5.245) Q1**

5. Vadavadagi, S.S., and **Chawla, S.* (2022).** Effect of rail axle load on geosynthetic reinforced back-to-back mechanically stabilized earth walls: Experimental and numerical studies, **Transportation Geotechnics,** Elsevier, https://doi.org/10.1016/j.trgeo.2022.100907. **(I.F.-5.245) Q1.** ***(Received the IGS-Kolkata Chapter YGE Award: Best paper on "Earth Retaining Structures")***

6. Suresh, D., and **Chawla, S.* (2022).** Comparative life cycle assessment of railway subballast layer with natural and coal overburden aggregates in India, International **Journal of Life Cycle Assessment, Springer, (I.F.-6.803), Q2.**

7. Thakur, R.N., Gupta, R.K., Gupta, S.K., Sinha, A., and **Chawla, S*. (2022).** Performance of jute geotextile treated with bitumen emulsion for subgrade improvement, **Arabian Journal of Geosciences, Springer, (I.F. 1.827), Q4.**

8. Gupta, R.K., and **Chawla, S.* (2021).** Performance Evaluation of Micropiles as a Ground Improvement Technique for Existing Railway Tracks – A Finite Element and Genetic

Programming Approach, International Journal of Geomechanics, **American Society of Civil Engineers (ASCE), 10.1061/(ASCE)GM.1943-5622.0002270, (I.F. 4.068), Q2.** ***(Received the IGS-Delhi Chapter YGE Award: Best paper on "Computational Geomechanics")***

9. **Chawla, S.,** Shahu, J.T and Saurabh, K. **(2021).** "Analysis of Cyclic Deformation and Post-Cyclic Strength of Reinforced Railway Tracks on Soft Subgrade", *Transportation Geotechnics, ELSEVIER,* **https://doi.org/10.1016/j.trgeo.2021.100535.**

10. Thakur, R.N., Gupta, S.K., Sinha, A., **Sowmiya Chawla** and Shilpa, S.V. **(2021)**. "A durability study of jute geotextile treated with bitumen emulsion", *Journal of Natural Fibres, Taylor and Francis***, https://doi.org/10.1080/15440478.2019.1623749.**

11. Jotheeshwar, V., Suresh K., Tandrila, S., Prashant, K.C., Ajay, K. T, Mahendra, P.S, **Chawla, S,** Pal, S.K. **(2021)**. "Comprehensive study on evaluation of Kaliasaur Landslide attributes in Garhwal Himalaya by the execution of geospatial, geotechnical and geophysical methods". Quaternary Science Advances, 3, ELSEVIER, **https://doi.org/10.1016/j.qsa.2021.100025.**

12. Banerjee, L., **Chawla, S.,** and Dash, S.K. **(2020)**. "Application of geocell reinforced coal mine overburden waste as subballast in railway tracks on weak subgrade", *Construction and Building Materials, ELSEVIER,* **https://doi.org/10.1016/j.conbuildmat.2020.120774.** ***(Received the IGS-Baroda Chapter YGE Award.: Best paper on "Ground Improvement")***

13. Banerjee, L., **Chawla, S.,** and Dash, S.K. **(2020)**. "Performance Evaluation of Coal Mine Overburden as Potential Sub-Ballast Material in Railways with Additional Improvement using Geocell", *Journal of Materials in Civil Engineering, ASCE,* **https://doi.org/10.1061/(ASCE)MT.1943-5533.0003269.**

14. Acharya, B., Sarkar, K and **Chawla, S. (2020).** "Preliminary slope stability analysis and discontinuities driven susceptibility zonation along a crucial highway corridor in higher Himalaya, India", *Journal of Mountain Science,* **https://doi.org/10.1007s11629-019-5524-6.**

15. **Sowmiya Chawla**, Shahu J.T and Gupta, R.K. (2019). "Design Methodology for Reinforced Railway Tracks based on Threshold Stress Approach", *Geosynthetics International,* Institution of Civil Engineers London, **https://doi.org/10.1680/jgein.18.00040.**

16. Banerjee, L., **Sowmiya Chawla**, Bhandari, G. (2019). "Experimental and 3-D Finite Element Analyses on Geocell Reinforced Embankments", Journal of Testing and Evaluation, ASTM International, 47(3), https://doi.org/10.1520/JTE20170686.

17. Chawla, A., Pasupuleti, S., **Sowmiya Chawla**, Rao, A.C.S., Sarkar, K., and Dwivedi, R. (2019). "Landslide Susceptibility Zonation Mapping: A Case Study from Darjeeling District, Eastern Himalayas, India", *Journal of the Indian Society of Remote Sensing*, Springer, **https://doi.org/10.1007/s12524-018-0916-6.**

18. **Sowmiya Chawla** and Shahu J.T (2018). "Numerical Study on the Benefits of Geosynthetic Reinforcement for a Typical Indian Railway Track", Indian Journal of Geosynthetics and Ground Improvement, *International Geosynthetics Society (India)*, 7(1), 17-21.

19. Chawla, A., **Sowmiya Chawla**, Pasupuleti, S., Rao, A.C.S., Sarkar, K., and Dwivedi, R. (2018). "Landslide Susceptibility Mapping in Darjeeling Himalayas, India", *Advances in Civil Engineering*, Natural Hazards Challenges to Civil Engineering Special Issue, pp:117, **https://doi.org/10.1155/2018/6416492**

20. **Sowmiya Chawla** and Shahu J.T. (2016). "Reinforcement and mud-pumping benefits of Geosynthetics in railway tracks: Model tests", *Geotextiles and Geomembranes*, Elsevier, 44, pp:366-380**, http://dx.doi.org/10.1016/j.geotexmem.2016.01.005** ***(Received the IGS-Chennai Chapter YGE Award: Best Paper on solutions for problematic soils)***

21. **Sowmiya Chawla** and Shahu J.T. (2016). "Reinforcement and mud-pumping benefits of Geosynthetics in railway tracks: Numerical analysis", *Geotextiles and Geomembranes*, Elsevier, 44, pp:344-357, **http://dx.doi.org/10.1016/j.geotexmem.2016.01.006**

22. **Sowmiya L.S.,** Shahu J.T. and Gupta K.K., (2015), "Performance of geosynthetic reinforcement on the ballasted railway track", *Lowland Technology International*, International Association of Lowland Technology (IALT): ISSN 1344-9656, 2015; 17 (2): pp: 83-92.

23. **Sowmiya, L.S.,** Shahu, J.T. and Gupta, K.K. (2014). "Stresses and Displacements in Reinforced Tracks", Proceedings of the Institution of Civil Engineers - Ground Improvement, Institution of Civil Engineers London, Vol. 167, (1), pp. 47-59. **http://dx.doi.org/10.1680/grim.13.00009**

24. Ilamparuthi K., and **Sowmiya L.S** (2009). "Study on Ground Improvement Techniques for Mitigating Soil Liquefaction", *International Journal of Earth Sciences and Engineering*, Vol.03.01 SPL. pp. 155-161.

Geotechnical Special Publications, ASCE

25. Banerjee, L., **Sowmiya Chawla** and Bhandari, G (2018). "Performance of geocell reinforced embankment over soft soil deposit", Geo-China 2018, ASCE Geotechnical Special Publication, July 23-25, 2018, Hangzhou, China **doi: 10.1007/978-3-319-957500**_6

26. Nath, B., **Sowmiya Chawla** and Gupta, R. (2018). "A study on utilization of mine overburden as a replacement of base and sub-base layers on rural roads", Geo-China 2018, ASCE Geotechnical Special Publication, July 23-25, 2018, Hangzhou, China. **doi: 10.1007/978-3-319-95750-0_7**

27. **Sowmiya Chawla,** Chawla, A and Pasupuleti, S (2017). "A feasible approach for Landslide Susceptibility Map", Geo-Risk 2017, ASCE Geotechnical Special Publication, June 4-7, 2017, Denver, USA, **https://ascelibrary.org/doi/10.1061/9780784480717.010**

International Conference Publications:

28. Gupta, R.K., and **Chawla, S.* (2024).** "Retrofitting Of Existing Railway Tracks Using Micropiles as A Ground Improvement Technique: Finite-Element and Genetic Programming Approach", 5th International Conference on Transportation Geotechnics, 5th ICTG 2024, Sydney, Australia., November 20-22.

29. Vadavadagi, S.S. and **Chawla, S.* (2024).** "Load-Bearing Behaviour of Geosynthetic Reinforced Soil Bridge Abutment for Railways with Waste Coal OB as Backfill Soil: Model Tests", 5th International Conference on Transportation Geotechnics, 5th ICTG 2024, Sydney, Australia., November 20-22.

30. Vadavadagi, S.S. and **Chawla, S (2021).** "Numerical and experimental analysis of internal stability of back-to-back mechanically stabilized earth walls supporting the rail

embankment system", 4th International Conference on Transportation Geotechnics, 4th ICTG 2021, Illinois, U.S., May 24-27

31. Banerjee, L., **Chawla, S.,** Dash, S.K (2021). "Finite Element Analyses of Geocell Reinforced Tracks Over Clayey Subgrade", 4th International Conference on Transportation Geotechnics, 4th ICTG 2021, Illinois, U.S., May 24-27.

32. Vadavadagi, S.S. and **Sowmiya Chawla** (2018). "Finite Element Analysis of Reinforced Retaining Wall for Railway Embankment", 20th International Conference on Soil Mechanics and Geotechnical Engineering, ICSMGE 2018, London, U.K., Aug 20-21. ***(Received the Best Presentation Award)***

33. Shahu J.T and **Sowmiya Chawla** (2018). "Evaluation of Geosynthetic Reinforced Tracks on Clayey Subgrade", Proceedings of International Symposium on Geotechnics for Transportation Infrastructure, ISGTI 2018, IIT Delhi, April 07-08, 2018, pp: 127-134.

34. **Sowmiya Chawla**, Ajit Kumar Singh, Ravindra Singh Dangi, Yogendra Kumar, Raman Deep, Sahil (2018). "Numerical Analysis of Effect of Berms, Shear Keys and Geotextiles on Embankment over Soft Soil", Proceedings of IIRAJ International Conference (ICCISEM 2018), Kuala Lumpur, Malaysia, 07 - 08 April 2018, ISBN: 978-93-5281-498-5.

35. **Sowmiya Chawla** and Shahu J.T (2016). "Numerical study on the benefits of geosynthetic reinforcement for a typical Indian railway track", 6th Asian Regional Conference on Geosynthetics, New Delhi, India.

36. **Sowmiya Chawla** and Shahu J.T (2016). "Model Test and Non-linear Analysis of Geosynthetic Reinforced Railway Tracks Laid on Delhi silt Subgrade", International Conference on Trends and Recent Advances in Civil Engineering, August 11-12, 2016, Noida, India.

37. **Sowmiya Chawla** and Shahu J.T (2016). "Stresses and Displacement Response of Geosynthetic Reinforced Railway Track", 10th International Symposium on Lowland Technology, 15-17 Sept.2016, Mangalore, India.

38. Shahu. J.T. and **Sowmiya L.S.** (2014). "Study on the benefits of geosynthetic reinforcement on ballasted railway track", International Conference on Advances in Civil and Mechanical Engineering Systems, 23-24 Dec.2014, Surat, India.

39. **Sowmiya, L.S.,** Shahu, J.T. and Gupta, K.K. (2014). "Study on the Performances of the Geosynthetic Reinforcement on the Ballasted Railway Track – Model test and Numerical Analysis", International Symposium on Lowland Technology (ISLT2014), 29th Sept. – 1st Oct. 2014, Saga University, Saga, Japan, pp: 326-331. ***(Received the Best Paper Award)***

40. **Sowmiya, L.S.** and Shahu, J.T. (2014). "Benefits of Geosynthetic Reinforcement on Typical Indian Railway Tracks". ICSCI 2014, ASCE India Section, Oct. 17-18, 2014, Hitex, Hyderabad, India, pp: 734-743.

41. **Sowmiya, L.S. (2014).** "Study on the Benefits of Geosynthetic Reinforcement – Typical Indian Railway Tracks", 10th International Conference on Geosynthetics, 10ICG, Young Geotechnical Engineers Secession, 21-25 Sept. 2014, Berlin.

42. Shahu. J.T., **Sowmiya L.S.** and Gupta. K.K. (2014). "Use of Geosynthetics on Railway Tracks", Proceedings of the Deep Foundations, Institute Middle East Conference, April, Dubai, UAE, pp 155-190.

43. **Sowmiya, L.S.,** Shahu, J.T. and Gupta, K.K. (2012). "Effect of Geosynthetic Reinforcement on Clayey Subgrade – Three Dimensional Finite Element Analysis on Railway Track", Proceedings of the International Conference on Ground Improvement and Ground Control (ICGI 2012), 30 Oct. – 2 Nov. 2012, University of Wollongong, Australia. pp: 863-868. ***(Received the Best Paper Award)***

44. **Sowmiya, L.S.,** and Ilamparuthi K. (2012). "Experimental Investigation on Ground Improvement Techniques for Mitigating Soil Liquefaction", International Conference on Ground Improvement and Ground Control – Transport Infrastructure Development and Natural Hazards Mitigation, ICGI Wollongong, Australia 2012. pp: 653-658.

45. Ilamparuthi K., and **Sowmiya L.S** (2009). "Study on Ground Improvement Techniques for Mitigating Soil Liquefaction", Proceedings of International Conference on Advances in Concrete, Structural and Geotechnical Engineering-2009, ACSGE-2009, Pilani, pp. 93.

46. Ilamparuthi K., and **Sowmiya L.S** (2008), "Study on Ground Improvement Techniques for Mitigating Soil Liquefaction", International Conference on 'Resource Utilization and Intelligent Systems', INCRUIS2K8, Kongu Engineering College, Erode January 2008.

National Conference Publications:

47. Rahul Abhishek, Pragati Saxena and **Chawla, S.*, (2022).** "Rockwool as a Potential Alternative to Conventional Geosynthetic Materials in Sustainable Ground Improvement Solutions", Proceedings of the Indian Geotechnical Conference 2022 Volume 4 - Geotechnics: Learning, Evaluation, Analysis and Practice (GEOLEAP).

48. Rahul Abhishek, and **Chawla, S.*, (2022).** "Large-Scale Direct Shear and Discrete Element Modelling Investigations of Ballast, Sub-Ballast, and Sleeper Interface Characteristics in a Railway Track Structure", Proceedings of the Indian Geotechnical Conference 2022 Volume 4 - Geotechnics: Learning, Evaluation, Analysis and Practice (GEOLEAP).

49. Vadavadagi, S.S. and **Chawla, S.*, (2022).** "Tensile Force Distribution of Geogrid Reinforced BBMSE Wall: Numerical Analysis and Model Study – Prediction by ANFIS", Proceedings of the Indian Geotechnical Conference 2022 Volume 4 - Geotechnics: Learning, Evaluation, Analysis and Practice (GEOLEAP).

50. Gupta, R.K., and **Chawla, S.*, (2021).** "Performance Evaluation of Micro Pile Reinforced Existing Railway Tracks Under Static and Moving Loads", Proceedings of Eighth Indian Young Geotechnical Engineers Conference 2021, October 21-23, 2021.

51. Raj, R., Singhal, A., Kumar, M. and **Sowmiya Chawla** (2018), "Effect of scaling of ballast particles on their morphological characteristics", Proceedings of Indian Geotechnical Conference-2018, 13-15 December 2018, IISc, Bengaluru. ***(Best Presentation Award)***

52. Vadavadagi, S.S., and **Sowmiya Chawla** (2018), "Behavior of reinforced retaining wall against railway embankment using MIDAS under static and seismic loading", Proceedings of Indian Geotechnical Conference-2018, 13-15 December 2018, IISc, Bengaluru.

53. Gupta, R.K., and **Sowmiya Chawla** (2018), "Finite element analysis of micropile reinforced subgrade in railway tracks", Proceedings of Indian Geotechnical Conference2018, 13-15 December 2018, IISc, Bengaluru.

54. Banerjee, L., **Sowmiya Chawla** and Dash, S.K. (2018), "Three dimensional finite element analyses of geocell reinforced railway tracks", Proceedings of Indian Geotechnical Conference-2018, 13-15 December 2018, IISc, Bengaluru. ***(Best Presentation Award)***

55. Acharya, B., Kundu, J., Sarkar, K and **Sowmiya Chawla** (2017), "Stability Assessment of a Critical Slope Near Nathpa Region, Himachal Pradesh, India", Proceedings of Indian Geotechnical Conference-2017, 14-16 December 2017, IIT Guwahati.

56. Banerjee, L., and **Sowmiya Chawla** (2017), "A Finite Element Approach of Stability Analysis of Over Burden Dump Slope - A Case Study", Proceedings of Indian Geotechnical Conference-2017, 14-16 December 2017, IIT Guwahati.

57. **Sowmiya L.S.** and Shahu J.T. (2015). "Study on the benefits of the advanced techniques used for instrumentation and monitoring of typical Indian railway track formations", Advances in Instrumentation, Geo-monitoring and Validation, 23-24 July 2015, Central Board of Irrigation & Power, Malcha Marg, Chanakyapuri, New Delhi.

58. **Sowmiya L.S.,** Shahu J.T. and Gupta K.K. (2014). "Numerical Modeling of Reinforced Railway Track Settlement", Proceedings of Indian Geotechnical Conference-2014, December 18-20, Kakinada, India. pp. 2601-2605.

59. **Sowmiya, L.S** and Shahu, J.T. (2012). "Study on advanced techniques used for instrumentation and monitoring of railway track formations", Indian Geotechnical Conference-2012, IIT Delhi. pp.444-447.

60. **Sowmiya, L.S.,** Gupta, K.K. and Shahu, J.T. (2011). "Railway Tracks on Clayey Subgrade Reinforced with Geosynthetics", Indian Geotechnical Conference-2011, Kochi. pp.529-532.

61. **Sowmiya, L.S.,** Gupta, K.K. and Shahu, J.T. (2011). "Finite Element Analysis of Railway Tracks on Clayey Soils Reinforced with Geosynthetics", Proceedings of Third Indian Young Geotechnical Engineers Conference (3IYGEC), New Delhi-16, pp.103-108. ***(Received the Best Paper Award)***

62. **Sowmiya, L.S.,** Shahu, J.T. and Gupta, K.K. (2010). "Three Dimensional Finite Element Analysis of Railway Track", Proceedings of Indian Geotechnical Conference-2010, GEOtrendz, IIT Bombay, Vol. II, pp. 909-912.

63. **Sowmiya, L.S.,** Gupta, K.K., Chille, K., Reddy, R. and Shahu, J.T. (2009). "Modification of Pond Ash by Surfactants", Proceedings of Indian Geotechnical Conference-2009, Guntur. pp. 312-315.

64. Ilamparuthi K. and **Sowmiya L.S** (2008), "Study on Ground Improvement Techniques for Mitigating Soil Liquefaction", Fourth Indian National Conference On Harbor and Ocean Engineering, INCHOE – 2007, National Institute of Technology Karnataka December 2007. pp. 299-306.

65. Ilamparuthi K. and **Sowmiya L.S** (2007), "Study on Ground Improvement Techniques for Mitigating Soil Liquefaction", Proceedings of National Symposium on Ground Improvement Techniques, St. Xavier's catholic College of Engineering, CIVILTECH – 2007, pp 76 to 77. (Received the Best Paper Award)

List of papers published as Book Chapter:

66. Banerjee, L., **Sowmiya Chawla** and Dash, S.K. **(2020),** "Three-dimensional finite element analyses of geocell reinforced railway tracks", *Geotechnical Characterization and Modelling, Springer*, pp 741-749.

67. Raj, R., Singhal, A., Kumar, M. and **Sowmiya Chawla (2020)**, "Effect of scaling of ballast particles on their morphological characteristics", *Geotechnical Characterization and Modelling, Springer.* DOI: 10.1007/978-981-15-6086-6_62.

68. Vadavadagi, S.S., and **Sowmiya Chawla (2020),** "Behavior of reinforced retaining wall against railway embankment using MIDAS under static and seismic loading", *Geohazards, Springer.*

69. Gupta, R.K., and **Sowmiya Chawla (2020),** "Finite element analysis of micropile reinforced subgrade in railway tracks", *Geotechnical Characterization and Modelling, Springer.*

70. Banerjee, L., **Sowmiya Chawla** and Bhandari, G **(2019).** "Performance of Geocell Reinforced Embankment over Soft Soil Deposit", *Current Geotechnical Engineering Aspects of Civil Infrastructures, Springer*, pp-69-82.

71. Shahu, J.T. and **Sowmiya Chawla (2019).** "Evaluation of Geosynthetic Reinforced Tracks on Clayey Subgrade", Geotechnics for Transportation Infrastructure – Recent Development, Upcoming Techniques and new Concepts, Springer.

72. Banerjee, L., **Sowmiya Chawla** and Bhandari, G **(2019).** "Performance of Geocell Reinforced Embankment over Soft Soil Deposit", Current Geotechnical Engineering Aspects of Civil Infrastructures, Springer, pp-69-82.

73. Nath, B., **Sowmiya Chawla** and Gupta, R. **(2019).** "A Study on Utilization of Mine Overburden as A Replacement of Base and Sub-Base Layers on Rural Roads", Current Geotechnical Engineering Aspects of Civil Infrastructures, Springer, pp-83-100.

74. Shahu, J.T. and **Sowmiya Chawla (2018).** "Evaluation of Geosynthetic Reinforced Tracks on Clayey Subgrade", *Proceedings of International Symposium on Geotechnics of Transportation Infrastructure, ISGTI 2018, IIT Delhi*, April 07-08, 2018, pp: 127-134.

75. **Sowmiya Chawla,** Chawla, A., and Pasupuleti, S. (2017). "A feasible approach for Landslide Susceptibility Map using GIS", Geo-Risk 2017, Impact of Spatial Variability, Probabilistic Site Characterization, and Geohazards, ASCE, pp. 101-110.

Technical Report:

76. **Chawla, S. (2020).** "Coupled three-dimensional non-linear finite element analysis of geocell reinforced railway tracks with mine waste," Completion Report submitted for DST (SERB) Sponsored Project- YSS/2015/000222, New Delhi.

77. Shahu J.T. and **Sowmiya L.S** (2012), "Consultancy for instrumentation and monitoring of construction of formation in field trial of new formation specification for heavy axle load", Report submitted to Research Designs and Standards Organization (Ministry of Railways) Lucknow.