

Curriculum Vitae

Dr. Santosh Kumar Behera

1. Personal details

Affiliations: Assistant Professor

Department of Mining Engineering
Indian Institute of Technology (Indian School of Mines)
Dhanbad
Jharkhand-826004, INDIA

Position: Assistant Professor

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Date of birth: 10/05/1990

Marital status: Married

Nationality: Indian

Sex: Male



2. Qualifications

- Ph. D. (Mining Engineering), thesis entitled "GEOMECHANICAL AND MICROSTRUCTURAL INVESTIGATIONS OF LEAD-ZINC MILL TAILINGS BASED PASTE BACKFILL FOR UNDERGROUND METALLIFEROUS MINES" from Indian Institute of Technology (Indian School of Mines) Dhanbad, India, 2021
- M. Tech (Mine Safety Engineering), AcSIR, CSIR-Central Institute of Mining and Fuel Research, Dhanbad, India, 2014
- B. Tech (Mining Engineering), Government College of Engineering (formerly OSME), Keonjhar, Biju Patnaik University of Technology (BPUT), Rourkela, India, 2012.

3. Research Experience

- 1 July 2025 to continuing: Assistant Professor, Department of Mining Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, Jharkhand-826004, India.
- April 2020 to June 2025: Senior Scientist, Mine Back Filling Research Group, CSIR-Central Institute of Mining and Fuel Research, Dhanbad, India.
- April 2016 to April 2020: Scientist, Mine Back Filling Research Group, CSIR-Central Institute of Mining and Fuel Research, Dhanbad, India.

- September 2012 to December 2015: Trainee Scientist, Mine Back Filling Research Group, CSIR-Central Institute of Mining and Fuel Research, Dhanbad, India.

4. Research specialisation

- Paste backfilling, cemented rock filling, high concentration cemented hydraulic filling, cemented and uncemented hydraulic backfilling, disposal of coal ash in opencast mines, underground coal mine backfilling and associated methods, underground metal mining.
- Geomechanics and ground control

5. Publications

SCI/Scopus Journals:

1. Prashant., Ghosh, C.N., Mandal, P.K., Dharendra, K., **Behera, S.K.**, 2016. Design of embankment for high concentration ash slurry filling in opencast mines – a case study. *Journal of Mines, Metals & Fuels*, Special Issue on CSIR-CIMFR, 450-454.
2. **Behera, S.K.**, Mishra, D.P., Ghosh, C.N., Prashant., Mandal. P.K., Singh, K.M.P., Buragohain, J., Singh, P.K., 2019a. Characterization of lead–zinc mill tailings, fly ash and their mixtures for paste backfilling in underground metalliferous mines. *Environmental Earth Sciences*, 78, 394. <https://doi.org/10.1007/s12665-019-8395-9>.
3. **Behera, S.K.**, Prashant, Mishra, D.P., Ghosh, C.N., Verma, A., Mohanty, S., Mishra, K., Singh, P.K., 2019b. Slump test: laboratory and numerical simulation based approach for consistency of mill tailings paste. *Current Science*, 117(2), 235-241.
4. Singh, P., Ghosh, C.N., **Behera, S.K.**, Mishra, K., Kumar, D., Buragohain, J., Mandal, P.K., 2019. Optimisation of binder alternative for cemented paste fill in underground metal mines. *Arabian Journal of Geosciences*, 12, 462. <https://doi.org/10.1007/s12517-019-4623-6>.
5. **Behera, S.K.**, Ghosh, C.N., Mishra, D.P., Singh, P., Mishra, K., Buragohain, J., Mandal, P.K., 2020a. Strength development and microstructural investigation of lead-zinc mill tailings based paste backfill with fly ash as alternative binder. *Cement and Concrete Composites*, 109, 103553. <https://doi.org/10.1016/j.cemconcomp.2020.103553>.
6. **Behera, S.K.**, Ghosh, C.N., Mishra, K., Mishra, D.P., Singh, P., Mandal, P.K., Buragohain, J., Sethi, M.K., 2020b. Utilisation of lead–zinc mill tailings and slag as paste backfill materials. *Environmental Earth Sciences*, 79, 389. <https://doi.org/10.1007/s12665-020-09132-x>.
7. **Behera, S.K.**, Mishra, D.P., Singh, P., Mishra, K., Mandal, S.K., Ghosh, C.N., Kumar, R., Mandal, Phanil K., 2021. Utilization of mill tailings, fly ash and slag as mine paste backfill material: Review and future perspective, *Construction and Building Materials*, Volume 309, 125120, ISSN 0950-0618, <https://doi.org/10.1016/j.conbuildmat.2021.125120>.
8. Mishra, K., Paul, P.S., Ghosh, C.N., Singh, P., **Behera, S.K.**, Mandal, P.K., 2022. Predicting and Optimising the Strength of Cemented Paste Fills Through Bayesian Network Model. *Mining, Metallurgy & Exploration* 39, 2095–2120. <https://doi.org/10.1007/s42461-022-00650-9>

9. **Behera, S.K.**, Mishra, D.P., Singh, P. et al. Tensile strength of cemented paste backfill for lead–zinc mill tailings: lab and in situ scenarios. *Arab J Geosci* 16, 451 (2023). <https://doi.org/10.1007/s12517-023-11536-5>
10. **Behera, S.K.**, Sngh, P., Mishra, .P., Mishra, K., Kumar, A., Mandal., S.K., Mandal, P.K., Mishra, A.K., (2023): Required strength design of cemented backfill for underground metalliferous mine, *International Journal of Mining, Reclamation and Environment*. DOI: 10.1080/17480930.2023.2242159
11. Mishra, K., **Behera, S.K.**, Patel, S.K., Singh, P., Buragohain, J., Hazra, B., Mandal, S. K., Kumar, R. Experimental Investigation on the Mechanical and Microstructural Properties of Cemented Coal Ash Based Paste Backfill Reinforced with Polypropylene Fibre. *Indian Geotech J* (2024). <https://doi.org/10.1007/s40098-024-01086-2>

Book Chapters:

1. **Behera, S.K.**, Singh, P., Mishra, K., Mandal, P.K., Mandal, S.K., Kumar, R. (2023). Underground Mine Backfilling Transition in Sukinda, Odisha: Present and Future. In: Sinha, A., Sarkar, B.C., Mandal, P.K. (eds) *Proceedings of the 10th Asian Mining Congress 2023*. AMC 2023. Springer Proceedings in Earth and Environmental Sciences. Springer, Cham. DOI: 10.1007/978-3-031-46966-4_22
2. **Behera, S.K.**, Singh, P., Mishra, K., Mandal, S.K., Kumar, R. (2025). Strength of In-Situ Backfill in Underground Hard Rock Mines. In: Gorai, A.K., Ram, S., Bishwal, R.M., Bhowmik, S. (eds) *Sustainable and Innovative Mining Practices. ICSIMP 2023*. Springer Proceedings in Earth and Environmental Sciences. Springer, Cham. https://doi.org/10.1007/978-3-031-76614-5_33

Other Journals:

1. **Behera, S. K.**, Pandit, K., Ghosh, C. N (2014): “Fibre Wrapping a Way for Externally Strengthening Rib Pillars”. The **IM & E Journal**, vol. 53 No. 08, pp. 25-30.
2. Ghosh, C. N, **Behera, S. K.**, Prashant., (2015): “Optimal Extraction of Coal Around Air Shaft Pillar - A Case Study”, The **MINETECH Journal**, vol. 35 No. 2, pp. 37-43.

National / International Conferences:

1. Mahapatra, S., Behera, S.K., Ghosh, C.N., 2013. An approach for blind backfilling in underground coal mines. 25th National Convention of Mining Engineers & POSTALE 2013, November 30-December 01, Dhanbad, 134-137.
2. Behera, S.K., Ghosh, C.N., 2015. Consolidation analysis of sand stowing in the depillared area around air shaft using PLAXIS 3D and stability analysis of air shaft. *Challenges in Mining and Mineral Industry (CMMI)*, September 26, Keonjhar, 85-93.
3. Behera, S.K., Prashant., Ghosh, C.N., Mandal, P.K., 2016. Design of embankment for safe back filling in opencast mines: A case study. *Recent Advance in Rock Engineering (RARE-2016)*, 16-18 November, Atlantis Press, Bengaluru, India, 199-205.
4. Prashant., Ghosh, C.N., Mandal, P.K., Behera, S.K., 2017. Granulated slag: An alternative material for stowing in underground coal mines. *NexGen Technologies for Mining and Fuel Industries (NxGnMiFu-2017)*, February 15-17, Allied Publishers Pvt. Ltd., New Delhi, India, 2, 975-982.
5. Srivastwa, S., Behera, S.K., Dhirendra, K., Prashant., Ghosh, C.N., 2017. Development of data management software to evaluate locked up coal. *NexGen Technologies for Mining and Fuel Industries (NxGnMiFu-2017)*, February 15-17, Allied Publishers Pvt. Ltd., New Delhi, India, 2, 29-32.

6. Ghosh, C.N., Behera, S.K., Mandal, Prabhat K., Prashant., Mandal, Phanil K., Das, A. J., Singh, P. K., 2017. Development of technology for extraction of locked up coal using artificial pillars. NexGen Technologies for Mining and Fuel Industries (NxGnMiFu-2017), February 15-17, Allied Publishers Pvt. Ltd., New Delhi, India, 2, 417-424.
7. Behera, S.K., Mishra, K., Prashant., Ghosh, C.N., Mandal, Phanil K., Samantray, A., Kumar, D., 2018. Cemented Hydraulic Filling – A Case Study. Technological Advancements and Emerging Mining Methods, August 24-25, Dhanbad, India, 196-206.
8. Behera, S.K., Ghosh, C.N., Prashant., Mishra, D.P., Mishra K., Mandal, Phanil K., Singh, K.M.P., Buragohain, J., Singh, P.K., 2018. Strength development in paste fill using mill tailings and slag. Current Practices in Mining & Allied Industries (CPMAI), Keonjhar, October 6-7, 2018, 89-100.
9. Prashant., Mishra, K., Mandal, P.K., Ghosh, C.N., Behera, S.K., Kumar, D., 2019. Optimization of bench design in opencast mines with coal ash and overburden as a backfill material. International Conference and Exhibition on energy & Environment: Challenges & Opportunities (ENCO), New Delhi, February 20-22, 1, 498-505.
10. Behera, S.K., Ghosh, C.N., Prashant., Mishra, D.P., Mishra, K., Behera, D., Mandal, P.K., Singh, K.M.P., Borgahin, J., Singh, P.K., 2019. Slag as a scope for alternative binder in paste backfilling. International Conference and Exhibition on energy & Environment: Challenges & Opportunities (ENCO), New Delhi, February 20-22, 2, 744-751.
11. Mishra, K., Ghosh, C.N., Paul, P.S., Prashant., Behera, S.K., Mandal, P.K., 2019. Analysis of paste fill strength in the stope: A Bayesian Network Modeling Approach. International Conference and Exhibition on energy & Environment: Challenges & Opportunities (ENCO), New Delhi, February 20-22, 2, 738-743.
12. Ghosh, C.N., Behera, S.K., Prashant., Mishra, D.P., Mishra, K., Mandal, P.K., 2019. Design of lead-zinc mill tailings paste with fly ash for filling the stopes in underground metal mines. 8th Asian Mining Congress, 6-9 November, Kolkata, India, 361-366.
13. Mishra, K., Prashant., Behera, S.K., Ghosh, C.N., Paul, P.S Mandal, P.K., 2020. Naïve bayes classifier approach for strength evaluation of paste fills for underground metal mines. National Conference on Advances in Mining (AIM), 14-15 February, CSIR-CIMFR, Barwa Road, Dhanbad, India, 210-216.
14. Panwar, N., Sharma, R., Malik, S., Dhiman, A., Revil, A., Behera, S.K., Khanna., S., 2022. Integration of SIP and MIP methods for pore-size distribution in carbonate rocks. Second International Meeting for Applied Geoscience & Energy, Society of Exploration Geophysicists and the American Association of Petroleum Geologists, 2198-2202. DOI:10.1190/image2022-3751698.1
15. Behera, S.K., Singh, P., et al., Paste backfilling in underground mines: Present scenario in India and future perspective, 9th Asian Mining Congress, 4-7 April, 2022, Kolkata, India, pp. 301-310
16. Behera, S.K., Singh, P., Mandal, S.K., Singh, V. et al. (2024). Pilot scale paste backfilling in underground coal mine: A case study, International Conference on Mine Ventilation and Environment for Green Mining (MVEGM-2024), Puri, Odisha, 20–22 December 2024.

6. Patent/copyright

01 copyright, Copyright office, Government of India, ROC Number: SW-9983/2018, ROC Date: 11 Jan 2018, Data Management Software for locked up coal details, Saurabh Srivastwa, Santosh Kumar Behera, Dr. C.N. Ghosh, Prashant, Dr. P.K. Mandal, Dr. P. K. Singh

7. Abroad visit, Conference/Seminars/Workshops

- Perth, 21st International Seminar on Paste and Thickened Tailings, Paste 2018, Australian Centre for Geomechanics, University of Western Australia.
- International symposium on rock fragmentation by Blasting: Fragblast 10, 2012, New Delhi, India.
- 25th National Convention of Mining Engineers & POSTALE 2013, Dhanbad, India
- National seminar on Challenges in Mining and Mineral Industry (CMMI), 2015, Keonjhar, India.
- International conference on Recent Advance in Rock Engineering (RARE-2016), 16-18 November, Bengaluru, India.
- International Conference on NexGen Technologies for Mining and Fuel Industries (NxGnMiFu-2017), New Delhi, India.
- National conference on Technological Advancements and Emerging Mining Methods, 2018, Dhanbad, India.
- National conference on Current Practices in Mining & Allied Industries (CPMAI), 2018, Keonjhar, India
- International Conference and Exhibition on energy & Environment: Challenges & Opportunities (ENCO), 2019, New Delhi, India
- National Conference on Advances in Mining (AIM), 2020, Dhanbad, India.
- 9th Asian Mining Congress, 2022, Kolkata, India
- 10th Asian Mining Congress, 2023, Kolkata, India

8. Projects

R & D projects:

1. Development of a Technology for Optimal Extraction of Locked-up Coal from Underground Mines using Artificial Pillars (ESC0105), CSIR network project, October 2012- March 2017, funded by CSIR, India, Role: member.

2. Development of suitable paste fill material from fly ash and its transportation system to underground coal mines for stabilisation of working as an alternative of sand stowing for increasing the percentage of extraction of coal and to ascertain its cost effectiveness with due regard to safety and environment in Sarni UG Mine, Pathakhera Area (WCL/GAP/MoC/118/2019-20), Western Coalfields Limited (WCL), 16 December, 2019 -15 December, 2021, Funded by Ministry of Coal (MoC), Role: Co-Principal Investigator.
3. Lab scale column study of paste backfill performance (MLP-81/2019-20), 16 April 2019 -30 September 2021, Funded by CSIR-CIMFR, Role: Principal Investigator.
4. Determination of flow characteristics of high concentration paste slurry in pipelines using laboratory scale pilot plant (MLP-132/2020-21), 1 April 2020- 31 March 2022, Funded by CSIR-CIMFR, Role: Co-Principal Investigator.
5. Study of rheological properties of Indian coal ash (MLP-15/16-17), 2016-2018, Funded by CSIR-CIMFR, Role: member.
6. Development of tandem approach for Paste Fill Technology and extraction methodology by continuous miner (CM) deployment for Shyampur B Colliery of Mugma Area, ECL(CIL/R&D/04/18/2022), GAP/CIL/128/2022-23 Funded by CIL R & D Board, Role: Principal Investigator

Industry sponsored/consultancy projects:

A. Underground metal mine:

1. Advice on development of paste fill for mine back filling at Sindesar Khurd (SK) Mines (CNP/4413/2016-17), Hindustan Zinc Limited (HZL), 17/08/2016-16/08/2017, Funded by HZL, Role: **Principal Investigator**.
2. Characterisation study of paste fill using mill tailings for back filling at SK Mines (SSP/139/2016-17), HZL, 17/08/2016-16/08/2018, Funded by HZL, Role: Member.
3. Determination of strength characteristics and development of material for backfilling at Rampura Agucha Mine (SSP/187/16-17), HZL, 31/03/2017-29/09/2019, Funded by HZL, Role: **Principal Investigator**.
4. Advice on replacement of cement with flyash for filling the stopes at Rampura Agucha Mine (CNP/4521/16-17), HZL, 31/03/2017-30/03/2018, Funded by HZL, Role: Member.
5. Advice on high density hydraulic filling using mill tailings to fill void of stoping area at Mochia and Balaria underground mine, HZL (CNP/4585/2017-18), HZL, 30/06/2017-29/06/2018, Funded by HZL, Role: **Principal Investigator**.
6. Advice on dry rock fill in secondary stope of Rajpura Dariba Mine, HZL (CNP/4776/18-19), 21/12/2018-20/12/2019, Funded by HZL, Role: **Principal Investigator**.

7. Advice on optimizing the use of cement for backfilling of stopes at Rajpura Dariba Mine, HZL (CNP/4790/2018-19), 19/12/2018-18/06/2020, Funded by HZL, Role: **Principal Investigator**.
8. Advice on fill optimization for Rajpura Dariba Mine, HZL (CNP/4871/2019-20), 01/08/2019-30/07/2020, Funded by HZL, Role: **Principal Investigator**.
9. Advice on Barricade design and high density hydraulic fill at Mochia and Paste fill at Zawarmala mines (CNP/5003/20-21), 28/09/2020-27/03/2021, Funded by HZL, Role: **Principal Investigator**.
10. Binder optimization and monitoring of Backfilling operation at Mochia and Zawarmala mines, HZL (SSP/520/20-21), 28/09/2020-27/09/2022, Funded by HZL, Role: **Principal Investigator**.
11. Advice on design of FRS Barricade for hydraulic filled stopes of Rajpura Dariba mines (CNP/5022/20-21), 15/01/2021-14/03/2021, Funded by HZL, Role: **Principal Investigator**.
12. Advice on commissioning of backfilling plant and design of backfill system for stope block 5 at Mahagiri mines, Indian Metal and Ferro Alloys Limited (IMFA) (CNP/4531/2017-18), 01/06/2017-28/02/2018, Funded by IMFA, Role: Member.
13. Scientific study on instrumentation and monitoring for backfilling of stope block 3 & 7 at Mahagiri Mines, IMFA (SSP/347/2018-19), 20/12/2018-18/12/2020, Funded by IMFA, Role: **Principal Investigator**.
14. Advice on backfilling of stope block 3 & 7 at Mahagiri mine, IMFA (CNP/4775/2018-19), 20/12/2018-19/12/2019, Funded by IMFA, Role: **Principal Investigator**.
15. Advice on suitability of crushed OB for cemented backfill at Mahagiri mine, IMFA (CNP/4886/2019-20), 11/09/2019-10/06/2020, Funded by IMFA, Role: **Principal Investigator**.
16. Advice on instrumentation scheme and monitoring on backfilling of stope blocks 1,4P and 6P at Mahagiri mine, IMFA (CNP/4921/2019-20), 13/11/2019-12/06/2020, Funded by IMFA, Role: **Principal Investigator**.
17. Instrumentation scheme and monitoring of backfilling stopes blocks of Mahagiri mines, IMFA (SSP/511/20-21), 14/09/2020-13/06/2021, Funded by IMFA, Role: **Principal Investigator**.
18. Advice on improvement of stowing efficiency for Balaghat underground mine, MOIL (CNP/4702/2018-19), 21/06/2018-20/06/2019, Funded by MOIL, Role: Member.
19. Mine backfill field and laboratory investigation for development of an underground mine at south kaliapani chromite mine (SSP/551/20-21), 16/03/2021-15/09/2021, Funded by OMC, Role: **Project coordinator**.

20. Instrumentation scheme and monitoring of backfilling of stope blocks of Mahagiri Mines (Chromite), M/s IMFA Ltd. (SSP/608/2021-22), 07/01/2022-06/01/2023, Funded by IMFA, Role: **Principal Investigator**.
21. Scientific study for backfill strength design, suitability of opencast overburden use, bottom ash use and fly ash use as binder in backfilling of stope blocks of Mahagiri Mines (Chromite) M/s IMFA Ltd (SSP/658/2022-23), 04/08/2022-02/08/2024, Funded by IMFA, Role: **Principal Investigator**.
22. Instrumentation scheme and monitoring of backfilling of Mahagiri mines (Chromite), M/s IMFA (SSP/723/2023-24), 11/04/2023-09/04/2024, Funded by IMFA, Role: **Principal Investigator**.
23. Scientific study for ground granulated blast furnace slag (GGBFS) implementation in paste fill at SK mine, HZL (SSP/768/2023-24), 24/08/2023-22/08/2026, Funded by HZL, Role: **Principal Investigator**.
24. Scientific study for feasibility of slag filling in underground stope blocks of Mahagiri mines (Chromite), M/s IMFA Ltd. (SSP/760/2023-24), 31/07/2023-29/07/2025, Funded by IMFA, Role: **Principal Investigator**.
25. Instrumentation scheme and monitoring of backfilling of Mahagiri mines (Chromite), M/s IMFA (SSP/838/2024-25), 02/05/2024-01/05/2025, Funded by IMFA, Role: **Principal Investigator**.
26. Scientific study on paste fill at RDM, Dariba, HZL (SSP/820/2024-25), 16/04/2024-15/04/2027, Funded by HZL, Role: **Principal Investigator**.
27. Scientific study to determine the suitable backfilling method for Ambahi Underground mine and scope of using waste rock, aggregate and marble waste as mine backfill material, GMDC (SSP/889/2024-25), 02/12/2024-01/12/2027, Funded by GMSC, Role: **Principal Investigator**
28. Scientific Study to Determine the Geo-Technical Parameter of Paste Fill, HCL, Malanjkhand (SSP/868/2024-25), 02/08/24-01/08/2027, Funded by HCL, Role: Member
29. Instrumentation scheme and monitoring of backfilling of Stope Blocks of Mahagiri Mines (Chromite) , M.s IMFA Ltd. (SSP/926/2024-25), Funded by IMFA, Role: **Principal Investigator**

B. Underground coal mine:

1. Monitoring of backfilling with bottom ash at Gare Palema IV/4 mine of Hindalco Industries (SSP/164/2016-17), Hindalco, 22/12/2016-21/12/2018, Funded by Hindalco, Role: Member.

2. Advice on use the use of bottom ash for depillaring with stowing at Gare Palema IV/4 mine of Hindalco Industries Limited (CNP/4472/2016-17), Hindalco, 22/12/2016-21/06/2018, Funded by Hindalco, Role: **Principal Investigator**.
3. Monitoring of backfilling with bottom ash at Gare Palema IV/5 mine of Hindalco Industries (SSP/162/2016-17), Hindalco, 29/11/2016-28/11/2018, Funded by Hindalco, Role: Member.
4. Advice on use the use of bottom ash for depillaring with stowing at Gare Palema IV/5 mine of Hindalco Industries Limited (CNP/4467/2016-17), Hindalco, 29/11/2016-28/05/2018, Funded by Hindalco, Role: **Principal Investigator**.
5. Advice on use the use of bottom ash from SGTPS power plant for underground stowing at Umaria U/G mines of SECL (CNP/4453/2016-17), 08/11/2016-07/05/2017, Funded by SECL, Role: Member.
6. Design of stowing plant for ash stowing at Banki 9 & 10 unerground mine of Korba Area, SECL (CNP/4448/2016-17), 17/10/2016-16/04/2017, Funded by SECL, Role: Member.
7. Advice on use of coal ash from Korba Super Thermal Power Station, NTPC for underground stowing at Surakachar mine, SECL (CNP/4593/2017-18), 05/07/2017-04/07/2019, Funded by NTPC Korba, Role: **Principal Investigator**.
8. Advice on use of pond ash from Ramagundam Super Thermal power Station, NTPC for underground stowing (CNP/4644/2017-18), 07/02/2018-06/05/2018, Funded by NTPC Ramagundam, Role: Member.
9. Advice on stabilization with stowing for mine no 3 & 4, Orient Area, MCL (CNP/4666/2017-18), 20/03/2018-19/09/2018, Funded by MCL, Role: **Principal Investigator**.
10. Advice on rock mechanics instrumentation and stability analysis for SS-3 panel of 4 seam SSB-3 panel of 3 seam at Vakilpalli mine, SCCL (CNP/4317/2015-16), 2016-2018, Funded by SCCL, Role: Member.
11. Scientific study for improving the stowing efficiency of Bheletand Colliery, TATA Steel (SSP/289/2018-19), 11/06/2018-10/06/2019, Funded by TATA Steel, Role: Member.
12. Scientific study on suitability of crushed overburden as stowing material for underground mines (SSP/294/2018-19), 21/06/2018-20/12/2018, Funded by HINDALCO, Role: Member.
13. Advice on use of coal ash from Jharsuguda Captive Power Plant for filling in underground mines (CNP/4958/20-21), 11/05/2020-10/08/2020, Funded by VEDANTA Power, Role: **Principal Investigator**.

14. Advice on suitability of bottom ash for stowing at Jitpur colliery, SAIL (CNP/4887/2019-20), 11/09/2019-10/06/2020, Funded by SAIL, Role: **Principal Investigator.**
15. Scientific study of stowing with 100% Bottom ash at Jitpur colliery, SAIL (SSP/529/20-21), 29/12/2020-28/12/2021, Funded by SAIL, Role: **Principal Investigator.**
16. Advice on use of bottom ash as a stowing material for underground mines of chasnala (CNP/5023/20-21), 19/01/2021-18/03/2021, Funded by SAIL, Role: **Principal Investigator.**
17. Pilot scale trail for paste backfilling in a mine site at Digwadiah, TATA Steel (SSP/621/2021-22), 10/03/2022-31/10/2024, Funded by TATA Steel, Role: **Principal Investigator.**
18. Advice study and preparation of on feasibility DPR for implementation of paste fill technology in Shyampur B colliery of Mugma Area, ECL (CNP/5068/2021-22), 05/08/2021-04/08/2022, Funded by ECL, Role: **Principal Investigator.**
19. Advice on scheme of backfill and strata monitoring at Quarry AB of West Bokaro Mine of M/s Tata Steel Limited (CNP/5172/2022-23), 6/4/2023-3/4/2025, Funded by Tata Steel, Role: **Principal Investigator.**
20. Scientific study for assessing the suitability of 100% bottom ash for hydraulic stowing in underground working of Chasnalla Colliery (SSP/825/2024-25), 22/04/2024-21/04/2025, Funded by SAIL, Role: **Principal Investigator.**

C. Opencast mine:

1. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase IV (CNP/4465/2016-17), Jindal Steel and Power Limited (JSPL), 29/11/2016-28/08/2017, Funded by JSPL, Role: Member.
2. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase V (CNP/4505/2016-17), Jindal Steel and Power Limited (JSPL), 10/03/2017-15/04/2017, Funded by JSPL, Role: Member.
3. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase VI (CNP/4538/2017-18), Jindal Steel and Power Limited (JSPL), 08/06/2017-07/12/2017, Funded by JSPL, Role: Member.
4. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase II (2) (CNP/4592/2017-18), Jindal Steel and Power Limited (JSPL), 23/08/2017-22/02/2018, Funded by JSPL, Role: Member.
5. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase II (3) (CNP/4616/2017-18), Jindal Steel and Power Limited (JSPL), 28/10/2017-12/05/2018, Funded by JSPL, Role: Member.

6. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase III (1) (CNP/4657/2017-18), Jindal Steel and Power Limited (JSPL), 09/03/2018-08/09/2018, Funded by JSPL, Role: Member.
7. Advice on the use of coal ash from DCPD with overburden at Gare Pelma IV/1 Opencast Mine, Tamnar, Phase-III(3) (CNP/4722/2018-19), 16/08/2018-15/02/2019, Funded by JSPL, Role: Member.
8. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase III (3) (CNP/4810/2019-20), 03/04/2019-02/10/2019, Funded by JSPL, Role: Member.
9. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase III (4) (CNP/4862/2019-20), 08/07/2019-07/01/2020, Funded by JSPL, Role: Member.
10. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase IV (1) (CNP/4909/2019-20), 04/11/2019-03/05/2020, Funded by JSPL, Role: Member.
11. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/I Opencast mine, Tamnar-Phase IV (2) (CNP/4923/2019-20), 01/01/2019-31/12/2019, Funded by JSPL, Role: Member.
12. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/1 opencast mine, Tamnar- Phase IV(3) (CNP/4953/20-21), 20/04/2020-14/10/2020, Funded by JSPL, Role: Member.
13. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/1 opencast mine , Tamnar- Phase IV/4 (CNP/4971/20-21), 01/03/2020-02/06/2020, Funded by JSPL, Role: Member.
14. Advice on use of coal ash from DCPD with overburden at Gare Palema IV/1 opencast mine, Tamnar (CNP/4981/20-21), 07/08/2020-06/02/2021, Funded by JSPL, Role: Member.
15. Advice on use of coal ash from DCPD with overburden at Gare Palma IV/1 opencast mine, Tamnar V/1 (CNP/5035/20-21), April 2020-24/03/2021, Funded by JSPL, Role: Member.
16. Feasibility study of ash filling in abandoned coal mine using ash from LANCO Power Limited (SSP/117/2016-17), 23/05/2016-22/11/2017, Funded by LANCO Power, Role: Member.
17. Advice on Ash filling in Manikpur Opencast Mines using ash from LANCO Amarkantak Power Limited, Korba (CNP/4799/2018-19), 11/03/2019-09/03/2020, Funded by LANCO Power, Role: Member.

18. Advice on fly ash filling at Gidhumuri and Paturia opencast mine using ash from CSPGCL (CNP/4836/2019-20), 24/05/2019-22/05/2020, Funded by CSPGCL, Role: Member.
19. Advice on fly ash filling in Gare Palema Sector III opencast coal mine using ash from CSPGCL (CNP/4811/2019-20), 03/04/2019-01/04/2020, Funded by CSPGCL, Role: Member.
20. Feasibility study for mine void filling with 25% ash in dumps of TLCMP, NTPC (SSP/837/2024-25), 02/05/24-01/05/28, Funded by NTPC, Talaipalli, Role: Member
21. Scientific study on Fly Ash – Bottom Ash dumping at Jamkhani Open Cast Coal Mines of M/s Vedanta Ltd. IB Valley Coal Field, Sundergarh, Odisha (SSP/915/2024-25), 28/11/24-27/11/28, Funded by Dhanasar Mininig, Role: Member.
22. Opencast backfilling in mines of JPL GP IV/I, IV/II and IV/III mines, JPL (SSP/884/2024-25), 01/11/2024-3/10/2028, Funded by JPL, Role: Member

D. Blind backfilling and ground stabilisation:

1. Advice on stabilization of G.P. top sea, working of Gopinathpur colliery below Nirsa township (CNP/4423/2016-17), 01/09/2016-28/02/2017, Funded by ECL, Role: Member.
2. Advice on identification and stability of voids below Andal-Sitarampur Railway track at Manoharbahal Colliery, Salanpur Area, ECL (CNP/4741/18-19), 17/08/2018-24/03/2020, Funded by ECL, Role: Member.
3. Advice on identification and stability of voids for setting upto 10 MMTPA Coal washery and railway siding in Korba Region, Chhattisgarh (CNP/4715/2018-19), 06/07/2018-05/07/2019, Funded by ADANI, Role: Member.
4. Advice on stability of underground workings and overlying strata at Talcher coalfields, MCL (CNP/4937/2019-20), 06/01/2020-05/07/2020, Funded by MCL, Role: **Principal Investigator.**
5. Design of Blind backfilling system for the unapproachable areas at Talcher coalfields, MCL-and advice thereof (CNP/4938/2019-20), 06/01/2020-05/10/2020, Funded by MCL, Role: **Principal Investigator.**
6. Monitoring of the blind backfilling system during filed implementation at Talcher coalfields, MCL (SSP/439/2019-20), 06/01/2020-04/01/2023, Funded by MCL, Role: **Principal Investigator.**
7. Advice on stability of the construction site for DAV school at Lingaraj Area (CNP/5006/20-21), 04/11/2020-03/02/2021, Funded by MCL, Role: Member.

E. Underground water retaining DAM design:

- Advice on assessment of water danger to Adriyala LW Project and design of water dam (CNP/4693/2018-19), Adriyala Longwall project, 11/06/2018-10/06/2019, Funded by SCCL, Role: Member.
- Advice on adequacy of barrier to be left against water and TG1 of LWP of ALP for drainage of inspection route, its stability and support design (CNP/4800/18-19), 11/03/2019-09/03/2020, Funded by SCCL, Role: Member.

9. Invited lectures

- Delivered key note lecture as the Chief Guest at the Engineers' Talk under the aegis of IEI Mining Division Board, The Webinar 57", for The Institution of Engineers (India)-Salem Local Centre on 11 December 2024.
- Delivered invited lecture on paste fill for underground metal mines at NIT Rourkela to Hindustan Zinc Limited (HZL) executives in the EDP on "MINE GEOTECHNICS FOR UNDERGROUND METALLIFEROUS MINES" on 19th June 2024.
- Delivered a guest lecture on paste fill at NIT Rourkela on 8 Feb 2024 in the International Workshop on Modern Ground-Control and Numerical-Modelling Techniques for Underground and Surface Excavations (MGNT-USE) from 5-9th February 2024.
- Invited talk on the topic "Paste filling for underground metal mines" at OSME, Keonjhar, Odisha on 14/04/2023.
- Invited talk on the topic "Paste fill technique for underground mine filling" at SECL HQ, Bilaspur, Chattisgarh, India on 12/04/2022.
- Invited lecture on mine paste backfilling at the National Online Workshop "SSM-2021" 18–22 March, 2021, Government College of Engineering (GCE) Keonjhar, Odisha, India.
- Lecture to Hindustan Zinc Limited (HZL) executives on Paste back filling for underground metal mines, 28/02/2019, Indian Institute of Technology (Indian School of Mines) Dhanbad, India

10. Professional Affiliations

- Member, The Indian Mining & Engineering Journal, IMEJRF 769.
- Member, Mining Engineers' Association of India (MEAI), (LM-5139/Dhanbad).
- Former Treasurer of Mining Engineers' Association of India (MEAI) Dhanbad Chapter.
- Institution of Engineers (India), Associate member, AM1864974.

- The Mining, Geological & Metallurgical Institute of India (MGMI), Life member, LM 10947.
- Institution of Engineers (India), Mining Engineering Division, Chartered Engineer.

11. Award

- Dr. K. N. Sinha Award (Highest IF of papers published in SCI Journals for scientific staff members, 2020) from CSIR-CIMFR, Dhanbad.
- The Inder Mohan Thapar Foundation (IMTF) Research Award for the year 2021 from IIT(ISM), Dhanbad
- SERB International Research Experience Fellowship for the year 2022-2023, from SCIENCE & ENGINEERING RESEARCH BOARD (SERB), India
- KHANIK SAMMAN 2024 from BCCL and Dainik Bhaskar, Dhanbad
- "IEI Young Engineers Award 2024-25" in Mining Engineering by The Institution of Engineers (India)
- MEAI - "Abheraj Baldota Memorial Gold Medal Award (Young Mining Engineer)" for the year 2024-25

12. International recognition

- Only person representing India in the panel of international experts in the Technical/Scientific Committee in MINEFILL 2026

13. Research IDs

- ORCID ID: 0000-0001-8009-6572
- Web of Science Researcher ID: AAZ-9091-2020
- Scopus Author ID: 57210099028

14. National/International Conference organised

- National Conference on Recent Challenges in Mining Industry (RCMI 2018), April 28, 2018, Organized by Mining Engineers' Association of India Dhanbad Chapter in

15. Reviewer

association with CSIR-Central Institute of Mining and Fuel Research Dhanbad -826015, Jharkhand, India, Role: Organising Secretary & Treasurer.

- Journal of Cleaner Production
- Construction and Building Materials
- Case Studies in Construction Materials
- Environmental Science and Pollution Research
- International Journal of Mining Science and Technology
- Journal of King Saud University - Engineering Sciences
- Environmental Earth Sciences
- International Journal of Mining, Reclamation and Environment
- Scientific Reports
- International Journal of Minerals, Metallurgy and Materials
- Energy Exploration & Exploitation
- JOM: The Journal of the Minerals, Metals, and Materials Society

16. Thesis supervised

- M Tech student supervised: 01
- B Tech student supervised : 04

Date: 06/07/2025

(Santosh Kumar Behera)

Dhanbad