

1. Name: Dr. Santosh Kumar Behera

2. Date of Birth: 10/05/1990

3. Current Position and Address (Include Email ID and Contact Number):

Scientist, Mine Back Filling Research Group,
CSIR-Central Institute of Mining and Fuel Research
Dhanbad, Jharkhand – 826015, India
Email: skb@cimfr.nic.in, skbcimfr@yahoo.com
Contact: +918986760221

4. Educational qualifications: (Graduation and above)

Sl. No.	Degree	Year of Passing	University/Institute	Subject
1	B. Tech	2012	Government College of Engineering (formerly OSME), Keonjhar, Biju Patnaik University of Technology (BPUT), Rourkela, Odisha	Mining Engineering
2	M. Tech	2014	AcSIR, CSIR-Central Institute of Mining and Fuel Research, Dhanbad, Jharkhand	Mine Safety Engineering
3	Ph. D.	2021	Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand	Mining Engineering

5. Work experience:

Designation	Institute/company	From	To	Nature of Work
Trainee Scientist	CSIR-Central Institute of Mining and Fuel Research, Dhanbad, Jharkhand	September 2012	December 2015	Research and development
Scientist	CSIR-Central Institute of Mining and Fuel Research, Dhanbad, Jharkhand	April 2016	Continuing	Research and development

6. Work Area(s)/ Specialization: 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, blind backfilling of underground coal mine voids, Numerical modeling

of various geotechnical structures (PLAXIS3D, FLAC3D), Rock mechanics instrumentation for ground control.

7. Major contributions (Max. 100 words): Considerable contributions in the field of paste backfilling for underground metalliferous mines, binder design for paste backfill application have resulted in tremendous cost saving in mine paste backfilling. Based on the findings of these studies five research articles have been published in peer reviewed SCI Journals. Extensive studies have been done for underground backfill barricade design and backfilling strategy. Further, the works carried out in the domain of underground coal mine backfilling are unique of their kind. To list a few, successful application of coal ash and mine overburden in underground coal mine backfilling are few of recent contributions.

8. No. of Research Publications:

- Papers in Journals: 08
- In conference proceedings: 13
- Invited lectures delivered: 03
- List of best 05 publications:
 - (i) 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>
 - (ii) 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.
 - (iii) 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>
 - (iv) 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>
 - (v) 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>

9. List of 5 Major Contract R&D Projects:

- (i) 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: Co-Principal Investigator.

- (ii)** 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.
 - (iii)** 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.
 - (iv)** 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: Co-Principal Investigator.
 - (v)** 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.
10. (a) Name of Patents/Copyrights applied /granted/commercialized:
- (i)** 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
- (b) Technologies/Products /knowhow/Services developed:
- (i)** Paste backfilling in underground metal mines.
 - (ii)** Paste backfilling in underground coal mines.
 - (iii)** Hydraulic stowing in underground coal mines using coal ash and mine overburden (OB).
 - (iv)** Blind backfilling of underground unapproachable areas.
 - (v)** Design of the plugs (DAMS) for underground mines.
 - (vi)** Backfill barricade design for underground metal mine.
 - (vii)** Cemented hydraulic slurry backfilling.
 - (viii)** Cemented rock fill.
 - (ix)** Required strength design of backfill.
 - (x)** Binder optimisation of backfill.
 - (xi)** Ash filling in opencast mines.
11. Honors/Awards/Recognitions/Fellowships/Scholarships/Professional Memberships received:
- (i)** Dr. K. N. Sinha Award (Highest IF of papers published in SCI Journals for scientific staff members, 2020) from CSIR-CIMFR, Dhanbad.
 - (ii)** Member, Mining Engineers' Association of India (MEAI), (LM-5139/Dhanbad).
 - (iii)** Treasurer of Mining Engineers' Association of India (MEAI) Dhanbad Chapter.

(iv) Institution of Engineers (India), Associate member, AM1864974.

12. Societal Contributions

(i) M. Tech Students guided for their project work: 01

(ii) B. Tech Students guided for their project work: 05

(iii) Disposal of mill tailings and fly ash is a socio-environmental problem, utilising mill tailings and fly ash for mine backfilling prevents many adverse social and environmental impacts.

(iv) There are number of inaccessible underground coal mine voids/galleries lying below the important surface features like railway line, highway and highly populated residential areas including township. Blind backfilling of these voids to save many lives and surface public properties, rail, road etc.