

CURRICULUM VITAE



Dr. Aditya Rana

डॉ. आदित्य राणा



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<https://scholar.google.co.in/citations?user=vaCCI8oAAAAJ&hl=en&oi=ao>



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Address:

MSA-14 (Type-II), CIMFR Colony, Barwa Road, Dhanbad, Jharkhand (PIN: 826 001)

Personal Information:

Father's Name: Sh. V.S. Rana
Mother's Name: Smt. Pavitra Singh
Date of Birth: Dec 12, 1989
Sex: Male
Nationality: Indian
Marital Status: Married
Languages: English & Hindi

Objective:

To become a leading researcher/consultant and contribute towards national development in field of Civil Engineering.

Professional Experience:



CSIR-Central Institute of Mining and Fuel Research, Dhanbad.

Designation: Senior Scientist

Duration: From April 15th, 2020 to till date

Designation: Scientist

Duration: From April 15th, 2016 to April 14th, 2020

Educational Qualifications:



Ph.D., 2017 (Civil/Structural Engineering)

Malaviya National Institute of Technology, Jaipur



M.Tech., 2013 (Transportation Engineering)

Roadways, Railways, Tunnels, Harbours and Airport Construction

Malaviya National Institute of Technology, Jaipur

CGPA: 08.62



B.E., 2011 (Civil Engineering)

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

Percentage: 70.63%



Higher Secondary Certificate (XII), 2007

St Paul's Con H.S. School, Ujjain, Central Board of Secondary Education,

New Delhi

Percentage: 81.80%



Secondary School Certificate (X), 2005

St. Paul's Con H.S. School Ujjain, Central Board of Secondary Education,

New Delhi

Percentage: 85.60%

Achievements:

- Appreciation from **Additional Director General, Border Roads Organisation** and **Director General, Council of Scientific and Industrial Research cum Secretary DSIR** for developing and disseminating “CSIR Controlled Blasting Technique” to enhance the progresses of war-prone strategic defence roads, near Indo-Pak and Indo-China borders, 2020. The nominee’s work accelerated the construction of defence roads as per the letter.
- Appreciation from Commander- 16 Border Roads Task Force, Border Roads Organization for transferring the technology of controlled blasting to accelerate road construction in high altitude terrain of **Kargil Sector**.
- Appreciation from OC-113 RCC, Border Roads Organization for developing “CSIR Controlled Blasting Technique” to enhance the progress of strategically important roads in **Galwan Valley** in the Sub-Sector of Ladakh, 2021. The progress of this strategically important road got enhanced as per the letter and the target has been attained.
- The research studies enabled State of Himachal Pradesh in resolving land use conflict with project affected persons of Sawra Kuddu Hydel Project (111 MW). The study results postulated helped in swift construction of the project as per the order of Hon NGT.
- Currently leading many research projects of national importance such as enhancing progress of BRO roads, widening of accident-prone rocky strata for railway doubling of Eastern Central Railway, construction of Sevoke-Rangpo tunnels, resolving land use conflict of Krishnaraja sagar Dam, etc.
- Toured the major part of far-flung North-West and North-East sector where the Government is focussing on the defence road constructions and accelerated the progress of various border roads on the request of BRO projects.

Awards:

- CSIR-Business Development Award: Certificate of Merit 2021
- Prof. B.K. Mazumdar Award 2021
- K.N. Sinha Award-2017

Projects:

S. No.	Title of Project	Project Category	Sponsoring Agency	Approx. Cost of Project
01	Advice and monitoring of blast design patterns for safe and efficient works of different strategic defence roads. (2020-till date)	Sponsored R&D	Border Roads Organisation, Ministry of Defence Role: Project Leader	Rs. 03.74 Crore
02	Advice for designing of safe and efficient blast design patterns for rock excavation works of different strategic roads of Border Roads Organisation (2020-till date)	Applied Research	Border Roads Organisation, Ministry of Defence Role: Project Leader	Rs. 1.16 Crore

S. No.	Title of Project	Project Category	Sponsoring Agency	Approx. Cost of Project
03	Advice for designing of safe and efficient blast design patterns for rock excavation works of different strategic roads of Border Roads Organisation. (2018- 2020)	Applied Research	Border Roads Organisation, Ministry of Defence Role: Project Leader	Rs. 01.77 Crore
04	Studying, modelling and evolving a new blasting technique for open cast mine excavations near the proximity of structures (beyond 50 m) using the structural response analysis and dynamic FEM	Grant-in - Aid	Ministry of Mines Role: Project Leader	Rs. 38.19 Lakh
05	Study of breakage pattern in tunnel blasting to evolve a new effective blasting. (2018-2021)	Applied Research	Council of Scientific & Industrial Research Role: Project Leader	Rs. 65 Lakh
06	Periodic monitoring of controlled deep hole blasting practices at Magadh OCP, Magadh Sanghmitra Area, CCL based on scientific study as per regulation 196 (3) of the coal mine regulation 2017. (2021-2022)	Sponsored R&D	CCL Role: Project Leader	Rs. 37.76 Lakh
07	Advice on finalizing the drilling and blasting patterns for tunnel excavations at Sivok (West Bengal- Sikkim) New Single line BG Railway Project. (2022)	Applied Research	ITD Cementation Limited Role: Project Leader	Rs. 26.55 Lakh
08	Finalized scheme for “Consultancy with supervision for finalizing scheme of blasting and slope stability between KM 6.6 to 8.0 in Karaila-Anpara section in connection with doubling of Karaila Road-Shaktinagar”. (2020)	Applied Research	East Central Railway Role: Project Leader	Rs. 12.98 Lakh
09	Advising on effects of quarry blasting activities on Krishnarajasagar Dam, Karnataka. (2022)	Applied Research	Cauveri Neeravari Nigam Ltd. Role: Project Leader	Rs. 18.58 Lakh
10	Scientific study for controlled blasting at J.K. Cement group of mines of J.K. Cement Works, Chittorgarh, Rajasthan. (2021- till date)	Sponsored R&D	J. K. Cement Works limited Role: Project Leader	Rs. 19.61 Lakh
11	Proof-Cheeking and vetting of different blasting patterns submitted by APCO Infratech (P) Ltd for excavation of main tunnel and Adit of T8 Sivok Rangpo Tunnel project. (2022)	Applied Research	APCO Infratech Private Limited Role: Project Leader	Rs. 05.90 Lakh
12	Scientific study to carry out controlled blasting and design-controlled blasting pattern and practice by using SME/SMS in OB and coal benches up to 240 mtrs and within 800 mtrs, from Kolgaon village in Kolgaon OCM, Wani Area, Chandrapur, Nagpur	Applied Research	WCL Role: Project Leader	Rs. 05.90 Lakh
13	Scientific study for the assessment of blasting impacts on the Railway Line and advice for designing of controlled blasting patterns at Nayagaon-Chainpura Limestone Mine.	Applied Research	J. K. Cement Works limited Role: Project Leader	Rs. 04.72 Lakh

S. No.	Title of Project	Project Category	Sponsoring Agency	Approx. Cost of Project
14	Scientific study and advice as per regulation 196(2), (3) and (4) of the CMR 2017 for controlled deep hole blasting at Ara-Kundi-Devalgadda and Chamatu Patches of Magadh OCP, Magadh-Amrapali Area	Applied Research	CCL Role: Project Leader	Rs. 08.26 Lakh
15	Scientific study for monitoring of blast design parameters at Western Quarry of Pakri Barwadih Coal Mining Project, NTPC Ltd. and analysis of ground vibration and air overpressure data for the safety of surrounding villages	Applied Research	NTPC Role: Project Leader	Rs. 24.66 Lakh
16	Scientific study for re-designing the controlled blasting parameters at Western Quarry of Pakri Barwadih Coal Mining Project, NTPC Limited, Hazaribag, Jharkhand	Applied Research	Thriveni Sainik Mining Private Limited Role: Project Leader	Rs. 09.52 Lakh
17	Advice for designing of controlled blasting patterns within danger zone at Chatti Bariatu Coal Mining Project of NTPC Ltd. Using SME/LED Explosives. (2019-20)	Applied Research	NTPC Hazaribagh Role: Project Leader	Rs. 07.20 Lakh
18	Advice for designing of controlled blasting patterns for the safety of nearby residential structures at Talabira-II_III OCP (2019-20)	Applied Research	M/s Talabira Mining Pvt. Ltd. Role: Project Leader	Rs. 09.44 Lakh
19	Design of controlled blasting patterns for the safety of nearby residential structures at Pakri Barwadih Mines (2020 Onwards)	Applied Research	M/s Triveni Pvt. Ltd. Role: Project Leader	Rs. 45.00 Lakh
20	Scientific study for controlled blasting at ACL Gare Palma mines and advice thereof. (2018-19)	Applied Research	M/s Ambuja Cement Ltd. Role: Project Leader	Rs. 05.90 Lakh
21	Advice on assessment of the effect of vibration due to blasting on nearby villages surrounding Bhanora West Opencast, Sripur area, ECL. (2018-19)	Applied Research	M/s Eastern Coalfield Role: Project Leader	Rs. 04.72 Lakh
22	Advice for designing of controlled blasting parameters at Pakri Barwadih (Western Pit) Coal Mining Project of NTPC for enhanced production and productivity with greater safety to the surrounding villages. (2019-20)	Sponsored R&D	NTPC Role: Project Leader	Rs. 06.00 Lakh
23	Advice for initial planning and designing of rock excavation work using controlled blasting at the stone quarries of Song Dam project, Department of Irrigation, Dehradun, Government of Uttarakhand. (2018-19)	Applied Research	Department of Irrigation, Dehradun, Govt. of Uttarakhand Role: Project Leader	Rs. 12.39 Lakh
24	Study and advice on blast-induced ground vibration due to excavation of additional adit to HRT, Sawra-Kuddu HEP, Hatkoti, HPPCL. (2017-18)	Applied Research	HPPCL (A subsidiary of Govt. of Himachal Pradesh) Role: Project Leader	Rs. 18.77 Lakh

S. No.	Title of Project	Project Category	Sponsoring Agency	Approx. Cost of Project
25	Advice for designing of controlled blasting patterns for the safety of nearby residential structures at Chormari and Degarhat Limestone mines (2020)	Applied Research	M/s Jaiprakash Associates Ltd.	Rs. 09.44 Lakh
			Role: Co-Project Leader	
26	Excavation and flattening of slopes at Bordave, Ukshi Yard, Agave and Shirasawane cuttings using controlled blasting under the jurisdiction of DGM/SW/RN in Ratnagiri Region, Navi Mumbai. (2019- till date)	Applied Research	M/s Konkan Railway Corporation Limited, Navi Mumbai	Rs. 53.46 Lakh
			Role: Co-Project Leader	
27	Scientific study to evolve a safe blast based on the monitoring of blasts event at ACC Gagaj Limestone Mine. (2018-till date)	Applied Research	M/s ACC Ltd., Barmana, H.P.	Rs. 62.00 Lakh
			Role: Co-Project Leader	
28	Advice for designing of safe and optimum blast design patterns and assessment of blasting impacts on nearby surface structures at Sitapuri Limestone Mine. (2019-20)	Applied Research	M/s UltraTech Cement Ltd. (Unit - Dhar Cement Works), Dhar, Madhya Pradesh	Rs. 05.00 Lakh
			Role: Co-Project Leader	

Publications: 23 (Total Citations: 624)

International SCI Journals: 12

- Gbetoglo Charles Komadja, **Aditya Rana**, Luc Adissin, Vitalis Anye, Gajendra Jadaun, Peter Azikiwe Onwualu, Chhangte Sawmliana. Assessing ground vibration caused by rock blasting in surface mines using machine-learning approaches: A comparison of CART, SVR and MARS. Sustainability 2022, Volume 14 (17) - 11060.
- **Aditya Rana**, Narayan Kumar Bhagat, Atul Singh, Pradeep Kumar Singh. Predicting blast-induced pull using regression tree. Arabian Journal of Geosciences, 15, Article number: 173 (2022)
- **Aditya Rana**, Siddharth Singh, N.K. Bhagat, M.M. Singh, G.P. Jadaun, P.K. Singh, “Evaluating the sustainability of a hydropower project in the Himalayas: A case study for resolving legal disputes in tribunals”, Renewable Energy, 2021, Elsevier (Impact Factor: 8.001), 174, 894-908.
- N.K. Bhagat, **Aditya Rana**, AK Mishra, MM Singh, A Singh, PK Singh, “Prediction of fly-rock during boulder blasting on infrastructure slopes using CART technique” Geomatics, Natural Hazards and Risk, 2021, Taylor & Francis (Impact Factor: 3.528), 12 (1), 1715-1740.
- **Aditya Rana**, N. K. Bhagat, G. P. Jadaun, S. Rukhaiyar, A. Pain, P. K. Singh. “Predicting Blast-Induced Ground Vibrations in Some Indian Tunnels: a Comparison of Decision Tree, Artificial Neural Network and

Multivariate Regression Methods”, Mining, Metallurgy & Exploration, 2020, Springer (Impact Factor: 1.413), 37, 1039–1053.

- N. K. Bhagat, A. K. Mishra, M. M. Singh, **Aditya Rana**, P. K. Singh. “Innovative Directional Controlled Blasting Technique for Excavation of Unstable Slopes along a Busy Transportation Route: a Case Study of Konkan Railway in India”, Mining, Metallurgy & Exploration, 2020, Springer (Impact Factor: 1.413), 37 (3), 833-850.
- N. K. Bhagat, A. K. Mishra, M. M. Singh, **Aditya Rana**, S. Tewari, P. K. Singh. “Blasting technique for stabilizing accident-prone slope for sustainable railway route”, Current Science, 2020, (Impact Factor: 0.850), 118 (6), 901-909.
- **Aditya Rana**, Pawan Kalla, Laszlo Csetenyi. “Recycling of Dimension Limestone Waste in Concrete”, International Journal of Mining, Reclamation and Environment, 2017, Taylor & Francis (**Impact Factor: 1.92**), 31, 231-250.
- **Aditya Rana**, Pawan Kalla, H. K. Verma, J. K. Mohnot. “Recycling of Dimension Stone Waste in Concrete: A Review”, Journal of Cleaner Production, 2016, Elsevier (**Impact Factor: 7.10**), 135, 312-331.
- Sarbjeet Singh, Ravindra Nagar, Vinay Agarwal, **Aditya Rana**. “Sustainable utilization of granite cutting waste in high strength concrete”. Journal of Cleaner Production, 2016, Elsevier (**Impact Factor: 7.10**), 116, 223-235.
- **Aditya Rana**, Pawan Kalla, Laszlo Csetenyi. “Sustainable use of marble slurry in concrete”, Journal of Cleaner production, 2015, Elsevier (**Impact Factor: 7.10**), 94, 304-311
- Pawan Kalla, **Aditya Rana**, Yog Bahadur Chad, Anurag Misra, Laszlo Csetenyi. “Durability studies on concrete containing wollastonite”. Journal of Cleaner production, 2015, Elsevier (**Impact Factor: 7.10**), 87, 726-734.

Non-SCI Journals: 1

- **Aditya Rana**, N. K. Bhagat, G. P. Jadaun, S. Rukhaiyar, A. Pain, P. K. Singh. Predicting Blast-Induced Ground Vibrations in Some Indian Tunnels using decision tree. Society of Mining Engineering. Aug2020, Vol.72 Issue 8, p47-48.

National Journals: 1

- **Aditya Rana**, Pawan Kalla, Sarbjeet Singh. “Mechanical and durability properties of concrete containing wollastonite”, Indian Concrete Institute, 2014, 15 (2), 7-12.

International/ National Conferences: 8

- **Aditya Rana**, V. Priyadarshi, R. S. Yadav, M. Zade, S. Bannerjee. “Controlled demolition of cliffs for land development of an International Airport in Navi Mumbai Suburbs, India”, National Seminar on Rock Blasting Techniques - Challenges and Opportunities (RBT-2018), CSIR-CIMFR, Dhanbad, 23-24 November 2018.

- M. P. Roy, V. K. Himanshu, R. K. Paswan, **Aditya Rana**, P. K. Singh. “Blast vibration analyses with reference to open pit and underground mines of India”, National Conference on Recent Challenges in Mining Industry (RCMI-2018), CSIR-CIMFR, Dhanbad, 28 April 2018.
- Mohit Sharma, **Aditya Rana**, Pawan Kalla. “Recycling Mining and Tailing Waste of Dimension Limestone (Kota stone) in Bituminous Roads”, Next Generation Technologies for Mining and Fuel Industries-2017 (NxGnMiFu 2017), Vigyan Bhawan, Delhi, 15-17 February 2017.
- **Aditya Rana**, Pawan Kalla, Sarbjeet Singh. “Rheology, Strength and Permeability of Concrete Containing Kota Stone Aggregate”, United Kingdom India Engineering Research Initiative, UKIERI-2015, NIT Jalandhar, 2-5 November-2015.
- Sarbjeet Singh, **Aditya Rana**, Ravindra Nagar, Vinay Agarwal. “Utilizing granite cutting waste in concrete as partial replacement of sand”, Kingdom India Engineering Research Initiative, UKIERI-2015, NIT Jalandhar, 2-5 November-2015.
- **Aditya Rana**, Sarbjeet Singh, Pawan Kalla. “Permeability and Carbonation Resistance of Wollastonite, Fly ash and Silica fume Added Concrete”. Paper presented at International Conference on Innovative Advancements in Engineering and Technology (IAET) – 2014, Jaipur National University, 7-8 March 2014.
- **Aditya Rana**, Sarbjeet Singh, Pawan Kalla. “Mechanical Properties of Concrete containing wollastonite-fly ash- silica fume combination”. Paper presented at 2nd International Conference on Advance Trends in Engineering & Technology (ICATET) –2014, Arya Engineering College, 18-19 April 2014.
- Sarbjeet Singh, **Aditya Rana**, Pushpendra Biwal. “Properties of Concrete containing Polymer Fibres”. Paper presented at 2nd International Conference on Advance Trends in Engineering & Technology (ICATET) – 2014, Arya Engineering College, 18-19 April 2014.

MoU/Agreements Initiated/ New Clients Added for CSIR-CIMFR With Personal Initiative:

- Initiated the conversation and re-convincing the top brass of Border Roads Organisation, MoD to renew the MoU with CSIR-CIMFR for 05 years.
- Initiated the conversation and Agreement with Director General of Naval Armament, MoD
- Initial agreement with Border Roads Organisation, MoD for “Advice for designing of safe and efficient blast design patterns for rock excavation works of different strategic roads”.
- Agreement with Irrigation Department, Dehradun, Uttarakhand for initial planning for the construction of Song Dam
- Agreement with EC Railway for excavation of accident-prone railway area.
- ITD Cementation Limited and APCO Infratech Ltd for the construction of Sivok-Rangpo Railway Line.
- Indian Army

Patents/Copyright:

- Harsh Anand, **Aditya Rana**, P. K. Singh. “Development of ‘CSIR-CIMFR Blast Guide’ Mobile Application for Android Smartphones”

- Easy slope stabilization and monitoring technique using geo-synthetic concrete cement mat and IOT devices.
- Dr. Pawan Kalla, **Aditya Rana**, Mohit Sharma, Prof. Ravindra Nagar, Prof. Inder Krishnan Bhat. “Recycling Kota-stone Waste as Aggregate in Bituminous Mixes”, (Patent No. 201611027417).

Professional Memberships:

- The Indian Science Congress Association (ISCA)
- The Institution of Engineers (India)
- Indian Roads Congress (IRC)

Reviewer:

- Mining, Metallurgy & Exploration, Springer Nature
- International Journal of Mining Reclamation and Environment, Taylor & Francis
- Journal of Cleaner Production, Elsevier
- Sustainable Materials & Technologies, Elsevier

Research Interest:

- Rock blasting
- Hill road cutting
- Tunnelling
- Sustainable hill development
- Combat Construction

Seminars/Conferences/Webinar/Workshops:

- Invited lectures delivered at (a) Two lectures at Faculty of Combat Engineering, College of Military Engineering, Pune (b) XVII Corps Panagarh, (c) XXXIII Corps Siliguri, (d) Commissioner of Industries, Udyog Bhawan, Government of Rajasthan
- A Speaker of CSIR sponsored webinar on “Eco-friendly rock excavation techniques for strategic and infrastructure projects: A CSIR success story”, April-2021.
- International Conference and Exhibition on Energy and Environment: Challenges and Opportunities (ENCO-2019), Vigyan Bhawan, New Delhi, 20-22 February 2019.
- National Seminar on Recent Advancements in Coal Carbonisation Opportunities and Challenges, CSIR-CIMFR, Dhanbad, 28-29 November 2019.
- National Conference on Recent Challenges in Mining Industry (RCMI-2018), CSIR-CIMFR, Dhanbad, 28 April 2018.

- National Seminar on Rock Blasting Techniques - Challenges and Opportunities (RBT-2018), CSIR-CIMFR, Dhanbad, 23-24 November 2018.
- Next Generation Technologies for Mining and Fuel Industries-2017 (NxGnMiFu 2017), Vigyan Bhawan, New Delhi, 15-17 February 2017.
- Art of Public Speaking and Technical writing workshop at CSIR-HRDC, Ghaziabad from 29-31 August 2016.
- “National Level Training Programme on Control Measures for Landslides”, CSIR-CBRI, Roorkee, 18-22 July 2016.
- “United Kingdom India Engineering Research Initiative Concrete Congress”, UKIERI-2015, NIT Jalandhar, 2-5 November 2015.
- IPR camp sponsored by PIC, DST, GoR Jaipur on “Intellectual Property Rights”, MNIT Jaipur, 26 March 2014.
- National Workshop on “Advances in Geotechnical Engineering for Infrastructure Development”, 12-13 August 2013.

Extra-Curricular Activities:

- Appointed as Sports President during university period.
- Appointed as Red House Captain in St. Paul’s Convent Sr. Sec. School, Ujjain.
- Secured First position in General Quiz Competition, Inter House Cricket Competition, Inter House Basket Ball Competition, Inter House Kho-Kho Competition at School levels.
- Participated in various Co-Curricular activities and won prizes.

Softwares:

- LS-Dyna, Rocscience, Matlab, Split-Desktop.

Hobbies:

- Power Lifting and Weight Training
- Reading Newspaper

Strength:

- Confident, Hardworking, Time Management
- Honest, Energetic, Quick learner
- Determined, Initiative-oriented, Helpful.

Declaration:

I do hereby declare that all the above-mentioned information are correct to the best of my knowledge and belief and I bear the responsibility for the correctness of these particulars.

Date: 18-11-2022

Place: Dhanbad

(Dr. Aditya Rana)