

RAJESH SINGH

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Education and Training

Veer Narmad South Gujarat University	Surat, Gujarat	Chemistry	B.Sc., 2000
-do-	-do-	Analytical Chemistry	M.Sc., 2002
-do-	-do-	Chemistry	Ph.D., 2008
University of Nebraska-Lincoln	Lincoln, NE	Biogeochemistry	Postdoc, 2016-17

Research and Professional Experience

2019-Present	Scientist D, National Institute of Hydrology, Roorkee
2014-2018	Scientist C, National Institute of Hydrology, Roorkee
2016-2017	Water Advanced Research and Innovation Fellow, UNL, NE
2011-2014	Scientist B, National Institute of Hydrology, Roorkee
2007-2011	Manager, Ion Exchange (India) Limited, Mumbai
2007-2011	Consultant, Total Water Management Services India Limited, Mumbai
2002-2007	Chemist, Steag Encotec India Private Limited, Surat

Publications

Refereed Journal Articles

- S. Kashyap, **R. Singh**, U. P. Singh, 2020. Inorganic and organic anion sensing by azole family members. *Coordination Chemistry Reviews*, 417, 213369.
- S. S. Kumar, A. Kumar, S. Singh, S. K. Malyan, S. Baram, J. Sharma, **R. Singh**, A. Pugazhendhi, 2020. Industrial wastes: Fly ash, steel slag and phosphogypsum- Potential candidates to mitigate greenhouse gas emissions from paddy fields. *Chemosphere*, 241, 124824.
- E. Salila, M. P. Sharma, **R. Singh**, 2020. Climate change impacts on water quality of water bodies - A review. *International Journal of Environment and Climate Change*, 10(3), 26-37.
- S. K. Malyan, **R. Singh**, M. Rawat, M. Kumar, A. Pugazhendhi, A. Kumar, V. Kumar, S. S. Kumar, 2019. An overview of carcinogenic pollutants in groundwater of India. *Biocatalysis and Agricultural Biotechnology*, 21, 101288.
- K. Singh, **R. Singh**, S. K. Malyan, M. Rawat, P. Kumar, S. Kumar, M. K. Sharma, G. Pandey, 2018. Health risk assessment of drinking water in Bathinda district, Punjab, India. *Journal of Indian Water Resources Society*, 38, 34-41.
- S. Kumar, A. A. Kazmi, N. C. Ghosh, **R. Singh**, 2017. Optimization of ballasted sand flocculation process for urban run-off treatment, *Journal of Indian Water Resources Society*, 37(4), 56-60.
- R. Singh**, B. Kanchan, P. Mondal, S. Singh. 2015. Water quality assessment of River Ganga - Health hazard identification and control. *International Journal of Scientific and Research Publication*, 5, 1-8.
- R. Singh**. 2014. Removal of oil from CO₂ compressor effluent of Ammonia Plant. *Journal of Indian Water Resources Society*, 34, 46-52.
- B. A. Shah, A. V. Shah, **R. Singh**, N. B. Patel, 2011. Reduction of Cr (VI) in electroplating wastewater and investigation on the sorptive removal by WBAP. *Environmental Progress & Sustainable Energy*, 30, 59-69.
- B. A. Shah, A. V. Shah, **R. Singh**, 2009. Sorption isotherms and kinetics of chromium uptake from wastewater using natural sorbent material. *International Journal of Environmental Science & Technology*, 6, 77-90.
- B. A. Shah, A. V. Shah, **R. Singh**, N. B. Patel, 2009. Sorptive removal of nickel onto weathered basaltic andesite products: kinetics and isotherms. *Journal of Environmental Science & Health, Part A*, 44, 880-895.

- R. Singh, B. A. Shah, Sujata**, 2008. SEM, TEM, PXRD, and equilibrium study of heavy metal sorption on weathered basaltic andesite products. *International Journal of Pure & Applied Chemistry*, 3, 192-200.
- Singh R., Shah A. V., Shah B. A.**, 2007. Sorption Behaviour of Cu (II) from acidic solution using weathered basalt and e-site products. *E-Journal of Chemistry*, 4, 587-605.

Non-refereed Articles

- R. Singh**, 2010. Is Sea Water Green? *Water Digest*, Nov-Dec., 2010, 26-32.
- R. Singh**, 2009. Water Recycling in Steel Plant. *Steel World*, Jan. 2009, 34-41.
- R. Singh**, 2009. Membrane Concentrate – Challenges in disposal and present practices. *Everything about Water*, Oct. 2009, 34-36.

Patent Filed

- R. Singh**, 2017. Fluoride removal media developed from bagasse fly ash and a method for synthesis thereof. Indian Patents, Application Number – 2649/DEL/2015 dt. 26.08.2015. *The Patent Office Journal* 09/2017, pp 5413

Book Chapters

- R. Singh, S. Kumar**, 2019. Impact of climate change on water quality. In *Climate Change and Its Impact on Water Resources of India* (Eds. S. K. Jain, P. K. Singh), NIH Roorkee, 178.
- R. Singh, O. Singh, V. C. Goyal, N. Singh**, 2018. UASBR: An effective wastewater treatment option to curb greenhouse gas emission. In *Indo-US Bilateral Workshop on Water-Food-Energy-Climate nexus: A perspective towards a sustainable future* (Ed. Rajeev P. Singh), K.R. Publishers & Distributors, Varanasi (ISBN: 978-93-88179-09-6), 23-26.
- R. Singh, C. K. Jain**, 2014. UASBR: An effective wastewater treatment option to curb greenhouse gas emission. In *Management of Natural Resources in the Changing Environment* (Eds. Raju N. J., Gossel, W., Sudhakar, M.), Springer and Capital publishers (ISBN: 978-3-319-12559-6), 125-134.
- R. Singh, S. Kumar, M. Garg**, 2014. Domestic Wastewater Treatment Using Tanfloc: A Tannin Based Coagulant. In *Geostatistical and Geospatial Approaches for the Characterization of Natural Resources in the Environment: Challenges, Processes and Strategies* (Ed. Raju N. J.), Springer and Capital publishers, New Delhi (ISBN: 978-93-81891-25-4), 202-205.
- S. Kumar, N. C. Ghosh, R. P. Singh, **R. Singh, S. Singh**, 2014. Impact of Canal Recharge on Groundwater Quality of Kolayat Area, District Bikaner, India. In *Geostatistical and Geospatial Approaches for the Characterization of Natural Resources in the Environment: Challenges, Processes and Strategies* (Ed. Raju N. J.), Springer and Capital publishers, New Delhi (ISBN: 978-93-81891-25-4), 198-201.
- R. Singh, V. K. Choubey**, 2013. Evaluation of anaerobic biological treatment for wastewater of ion exchange (IX) resin manufacturing facility. In *Environmental Technology* (Eds. Khanna D. R., Chopra A. K., Matta G., Bhutiani R. and Singh V.), Daya Publishing House (Astral International Pvt. Ltd.), New Delhi (ISBN: 9788170358237), 15-23.

Paper Published in Conferences

- “Water quality status of upper Ganga canal”, “Contamination in Drinking Water Supply: A case study of Shimla City, Himachal Pradesh”, and “Greenhouse gases mitigation through industrial byproduct in rice soil” in STIWM-2018 organized by IIT Roorkee and IWRS at Roorkee, Feb. 16-19, 2018.
- “Assessment of groundwater quality with special reference to arsenic in Ballia District, Uttar Pradesh, India” in Hydro-2018 organized by NIT Patna at Patna, Dec. 19-21, 2018.
- “Hydrochemical characteristics of river Ganga in head water region between Gangotri & Haridwar, Uttarakhand, India” in RHAR-2019 organized by IIT BHU at Varanasi, Feb. 14-16, 2019.
- “Source identification for arsenic in groundwater of South-western Nebraska” and “Evaluation of hydrogeochemistry and groundwater quality in Lalitpur district, Bundelkhand region, Uttar Pradesh, India” in IGWC-2017 organized by NIH, CGWB, and AGGS at New Delhi, Dec. 11-13, 2017.

- “Investigating rural drinking water supply options- A case study for parts of Chitrakoot district in Uttar Pradesh” in 3rd India Water Week 2015 (Water Management for Sustainable Development organized by Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, New Delhi, 13th – 17th January 2015).
- “Assessment of hydro-geochemistry and the quality of River Ganga in a stretch from Gangotri to Haridwar”, “Investigation of trace metals in groundwater of Moth Block, Jhansi, Uttar Pradesh, India”, “Temporal variations in the physico-chemical characteristics of River Ganga at Haridwar”, and “Groundwater quality evaluation of Shimla City” in Symposium on Hydrology – 2015 organized by Indian Association of Hydrologists, National Institute of Hydrology, and Central Water Commission at New Delhi, 22nd – 23rd December, 2015.
- “Domestic Wastewater Treatment Using Tanfloc: A Tannin Based Coagulant” and “Impact of Canal Recharge on Groundwater Quality of Kolayat Area, District Bikaner, India” in IAMG 16th Conference (Geostatistical and Geospatial Approaches for the characterization of Natural Resources in the Environment: Challenges, Processes and Strategies) organized by Jawaharlal Nehru University, New Delhi, 17th – 20th October, 2014.
- “UASBR: An effective wastewater treatment option to curb greenhouse gas (GHG) emissions” in International Humboldt Kolleg on Management of Water, Energy and Bio-resources in Changing Climate Regime: Emerging Issues and Environmental Challenges (IHK-2013)” organized by Jawaharlal Nehru University, New Delhi, 8th – 9th February, 2013
- “Recycling and reuse of water in Steel industry” and “Estimation of re-aeration and de-oxygenation coefficients for self-purification capacity of the Hindon River” in Indian Desalination Congress on Water desalination, Treatment and Management (InDACON-2013)” organized by Malaviya National Institute and Technology, Jaipur, 21st– 22nd February, 2013.
- “Reduction of Cr (VI) ions in aqueous solution by hydrazinium sulfate: Kinetics and equilibrium studies” in NEA Conference (Harmony 2013) organized by DDU Gorakhpur University, Gorakhpur, 11th-13th November, 2013.
- “Treatability study for organic and color removal from denim industry wastewater: An approach towards zero liquid discharge” in National symposium on “Water Resources Management in Changing Environment (WARMICE-2012)” organized by National Institute of Hydrology, Roorkee, 8th–9th February, 2012
- “Evaluation of anaerobic biological treatment for wastewater of IX resin manufacturing facility” in International Conference on “World Congress for Man & Nature (Global Climate Change and Biodiversity Conservation)” organized by Gurukul Kangri Vishwavidyalaya, Haridwar, 11th–13th November, 2011
- “Reduction of Cr (VI) in electroplating industry and investigation on the sorptive removal by WBAP” in International Conference on Water, Environment, Energy, & Society (WEES-2009) organized by National Institute of Hydrology, Roorkee (Uttaranchal), 12th–16th January, 2009
- “A novel green method to synthesize zeolites from the bagasse fly ash (a sugar industry waste)” and “Sorptive removal of methylene blue” in International Conference on Water, Environment, Energy, & Society (WEES-2009) organized by National Institute of Hydrology, Roorkee (Uttaranchal), 12th–16th January, 2009
- “Thermodynamics of Cu (II) sorption onto andesite from aqueous solution” in 2nd conference on Thermodynamics of Chemical and Biological Systems of “The Indian Thermodynamics Society” organized by Veer Narmad South Gujarat University, Surat (Gujarat), 30th October – 1st November, 2006 and awarded second prize for the best presentation
- “Sorptive removal of Ni (II) from electroplating wastewater by andesite as the sorbent” in 25th conference of “Indian Council of Chemists” organized by Birla College, Kalyan, Mumbai (Maharashtra), 27th – 29th December, 2006
- “Bentonite for harmful metal removal from aqueous solution” in 24th conference of “Indian Council of Chemists” organized by Bit, Mesra, Ranchi (Jharkhand), 16th – 18th December, 2005
- “Presenting a novel design flow chart of effluent treatment plant for the power station at Hazira (GSEG)” in 22nd conference of “Indian Council of Chemists” organized by IIT, Roorkee (Uttaranchal), 17th – 19th October, 2003
- “Minimization of copper from industrial effluent with the help of chelating resin” in TAGRSM-2003, Indian Chemical Society Vadodara Chapter, on 23rd February, 2003

Major Projects

Ongoing

- Water quality assessment of southwest Punjab emphasizing carcinogenic contaminants and their possible remedial measures – *PDS Study, NHP, MoWR RD & GR (Rs. 6.56 million)*

- Hydro-geochemical evolution & occurrence of arsenic in aquifer of Central Ganges Basin – *PDS Study, NHP, MoWR RD & GR (Rs. 7.0 million)*
- Water efficient irrigation by using SCADA system for medium irrigation project (MIP) Shahnehar - *PDS Study, NHP, MoWR RD & GR (Rs. 7.5 million)*
- In-situ bioremediation of non-aqueous phase liquids (NAPLs) pollution within the Baddi-Barotiwala Nalagarh (BBN) Industrial Area in Himachal Pradesh, India - *DST (UKIERI) (Rs. 1.67 million)*
- Conservation of ponds in Ibrahimpur-Masahi village and performance evaluation of natural treatment system - *NIH Roorkee & CEH, UK*
- Innovation centre for Eco-prudent wastewater solutions (IC-ECOWS) – *DST (WATER-IC) (Rs. 85.69 million)*
- Water quality assessment of Haridwar district - *NIH Roorkee (Rs. 1.71 million)*
- Understanding of hydrological processes in Upper Ganga basin by using isotopic techniques – *DST (NMSHE) (Rs. 22.5 million)*
- Integrated hydrological studies for Upper Ganga Basin upto Rishikesh - *DST (NMSHE) (Rs. 17.7 million)*

Completed

- Environmental flow assessment for Yamuna River from Hathnikund barrage to Okhla barrage - *NMCG, DoWR, RD & GR, MoJ (Rs. 10.46 million)*
- Preparation of strategic land and water management plan for rejuvenation of Rispana river system - *Uttarakhand Irrigation Department, Dehradun (Rs. 8.61 million)*
- Action research on IWRM plan for water security in identified villages of Western UP - *INCSW, DoWR, RD & GR, MoJ (Rs. 83 million)*
- Rejuvenation of Village Ponds in Identified Villages of Baghpat, Ghaziabad and Meerut Districts of Uttar Pradesh - *NIH Roorkee (Rs. 85.69 million)*
- Microbial dissolution of arsenopyrite ore - *IUSSTF, DST, & UNL (Rs. 3.32 million)*
- Hydro-geological investigations (under aquifer mapping) of Jhansi & Lalitpur districts of Bundelkhand region - *WAPCOS, MoWR RD & GR (Rs. 13.58 million)*
- Impact of sewage effluent on drinking water sources of Shimla and suggesting ameliorative measures - *PDS Study, HP-II, MoWR (Rs. 7.08 million)*
- Potential impact of pollution on water resources in Singrauli Area - *NGT, New Delhi*
- Himalayan river water quality assessment in a stretch from Gangotri to Haridwar - *NIH Roorkee (Rs. 2.35 million)*
- Development of low cost media for fluoride removal from drinking water of fluoride affected areas - *NIH Roorkee (Rs. 2.0 million)*
- Prioritization of pollution abatement activities in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, & West Bengal for Nirmal Ganga - *MoWR, RD & GR, GOI*
- Pollution caused by leather tanning industry to the water bodies in Unnao district of Uttar Pradesh - *MoWR, RD & GR, GOI*
- Pilot study on groundwater pollution in Hindon-Kali-Krishni river catchment in Western Uttar Pradesh - *WSSO, UP (Rs. 2.01 million)*
- Assessment of ground water contamination due to past storage of spent wash in kachcha lagoons and suggesting remedial measures - *Saraya Distillery, Sardarnagar, Gorakhpur (Rs. 0.57 million)*

Invited Talks

- Invited talk titled “UASB Reactor for organics removal from industrial effluent” in Brainstorming session to discuss the findings and future work plan for the ongoing Ramanujan Project entitled “Bioremediation of LNAPL polluted land under (Semi)-arid coastal environmental conditions” at IIT Roorkee on Nov. 10, 2014.
- Invited talk titled “Water Chemistry & Characteristics” and “Wastewater treatment techniques” in training course entitled “Water supply management, treatment and rain water harvesting & recovery techniques” organized by Ordinance factories institute of learning, Dehradun during June 29 – July 03, 2015.
- Invited talk titled “Groundwater Quality and Control” in Workshop entitled “भूजल का विवेकपूर्ण उपयोग एवं जन सहभागिता – समय की मांग” organized by Groundwater Division, Muradabad on July 22, 2015.

- Invited talk titled “Basics of wastewater treatment” and “Membranes in water & wastewater treatment” in Short term (QIP) course on “Environmental Engineering and Practices” organized by Madhav Institute of Technology, Gwalior during March 08-18, 2016.
- Invited talk titled “Findings of Reconnaissance Survey of Jhansi & Lalitpur w.r.t. Hydrogeochemical Parameters” in “Exploration of the Natural Resources in the Bundelkhand Region” organized by DST, New Delhi & Bundelkhand University, Jhansi organized during March 10-11, 2016.
- Invited talk titled “Treatment Techniques for Industrial Effluents Polluting Soil & Water Resources” in training course entitled “Investigation, Remediation & Management of Soil & Groundwater Contaminated Sites” organized by DOH, IIT Roorkee during Nov. 20-22, 2017.
- Invited talk titled “Reuse of Municipal Wastewater for Irrigation: A Solution to Water Scarcity” and “Ground water contaminant remediation with emphasis on arsenic” in short term course entitled “Strategies for sustainable development: Goals and Issues” organized by Madan Mohan Malaviya University of Technology, Gorakhpur during Feb. 19-25, 2018.
- Invited talk titled “Treatment technologies for urban wastewater management and reuse in agriculture” in international training course on “Soil – Water Conservation and Watershed Management” organized by ICAR-Indian Institute of Soil & Water Conservation, Dehradun during March 06-20, 2018.
- Invited talk titled “Water quality testing methods” and “Treatment techniques for wastewater management and reuse in agriculture” for Ph.D. Course Work Program at Bundelkhand University, Jhansi during Dec. 10-11, 2018.
- Invited talk titled “Water quality monitoring planning” and “Water quality testing methods” in a certificate course on ‘Monitoring of Environmental Parameters and Their Interpretation’ is being organized at Centre of Land and Water Resource Management (CLWRM), GBPNIHESD, Almora during Feb. 26 – March 14, 2019.
- Invited talk titled “Water Quality: Monitoring & Assessment” in a training course on ‘Water Audit & Rain Water Harvesting’ is being organized at Dept. of Water Resources Development & Management, IIT Roorkee during 18-22 February, 2019.

International/National conferences/meetings organized

- Joint organizing secretary for brainstorming session on “Hydrological aspects of cloudburst & flash floods in Himalayas” at Library building, CWC, New Delhi on Jan. 10, 2014.
- Joint Organizing Secretary for organizing “Symposium on Hydrology” organized by IAH, NIH, & CWC during Dec. 22-23, 2015 at New Delhi.

Important awards/distinctions/recognitions

- Member of ‘Public Drinking Water Services Sectional committee, SSD 14’ constituted by BIS, New Delhi (2020-21).
- Member of committee for evaluation of District Level Inspire Award Exhibition and Project Competition conducted by State Council of Education Research and Training, GoUK for year 2018-19 & 2019-20.
- Member of committee for organization of Poster Session during IGWC-2017 conference.
- Joint Secretary of Indian Association of Hydrologists, Roorkee since 2013.
- Member of committee for “Examining and recommending the proposals received for one day awareness workshop/seminar and to undertake the studies” constituted by IIT Roorkee.
- Member of judging committee for Biology Graduate Student Association (BGSA) Symposium – 2017, University of Nebraska-Lincoln, Lincoln, Nebraska, US.
- Member of judging committee for poster evaluation in Water for Food Global Conference-2017, Daugherty Water for Food Global Institute, University of Nebraska-Lincoln, Lincoln, Nebraska, US.
- Nominated member of core-committee on “Monitoring of Potential Hazards of Industrial Development in Singrauli Area” constituted by Hon’ble NGT.
- Received prestigious Water Advanced Research and Innovation (WARI) Fellowship program supported by DST-GOI, UNL, DWFI, & IUSSTF for 2016-17.
- Member of Sub-committee – 2 on “Potential impact of pollution on water Resources” constituted by Hon’ble NGT during 2014-16.
- Member of Committee for “Preparation of a ready reckoner for water quality laboratory” constituted by MoWR, RD & GR.

- External expert of assessment committee to assess the progress of JRF, for upgradation to SRF (05 committees).

Synergistic Activities

- **Graduate research mentor:** 15 graduate students mentored since arriving at NIH Roorkee in 2011
- **Assistant Executive Engineer (Civil):** Maintenance, National Institute of Hydrology, Roorkee (2020-Present)
- **Joint Secretary:** Indian Association of Hydrologists, Roorkee (2013 – Present)
- **Officer In-charge:** Workshop, National Institute of Hydrology, Roorkee (2017-2019)
- **Officer In-charge:** Water Quality Laboratory, National Institute of Hydrology, Roorkee (2014-2016)
- **Development/presentation of public/stakeholder outreach programs:** “Water Quality & its Management” presentation series presented at workshops for the I&PHE Department, Himachal Pradesh, Shimla. “Water & Wastewater Treatment” presentation series presented at Short term (QIP) course on “Environmental Engineering and Practices” for faculties of Madhya Pradesh at Madhav Institute of Technology, Gwalior. “Reuse of Wastewater” presentation series presented for “Global Initiative of Academic Networks Workshop” organized by IIT Roorkee. “Water Quality: Concepts & Analysis” presentation series presented for “Irrigation research Institute, Govt. of Uttarakhand officers” organized by NIH Roorkee. “Water Quality Assessment & Management” presentation series presented for “Central and State Govt. officers” organized by NIH Roorkee.
- **Reviewer for journals** such as *Journal of Indian Water Resources Society*, *Journal of Hydrology*, *Water Environment Research*, *Journal of Environmental Management*

Graduate Advisors and Postdoctoral Sponsors: Graduate advisor: Dr. Bhavna A. Shah (Veer Narmad South Gujarat University, Surat, India); Postdoctoral Advisor: Dr. Karrie A. Weber (University of Nebraska-Lincoln, Nebraska)