

Dr. Sumit Sen

Professor in Hydrology & Head, Department of Hydrology,
Indian Institute of Technology Roorkee (IITR), Roorkee, Uttarakhand, India 247667
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Professional and Educational Qualifications

- 2009 Doctor of Civil Engineering (*Concentration: Biosystems Engineering*), Auburn University (AU), AL, USA
- 2004 Master of Science Biological and Agricultural Engineering, University of Arkansas, Fayetteville, AR, USA
- 2001 Bachelor of Science Agricultural Engineering, Allahabad Agricultural Institute Deemed University, Allahabad, Uttar Pradesh, India

Summary of Professional Expertise

Currently, I am working as a Professor & Head in the Department of Hydrology at IIT Roorkee. Last three years, I led the Centre of Excellence in Disaster Mitigation and Management, IITR as the Head. My research and teaching interests are in experimental hydrology, water resources management, watershed management, monitoring and modeling; rainfall-runoff modeling. I have extensive experience in instrumenting experimental watersheds to understand the hydrogeological, ecological and fluvial processes and their impacts on ecosystems. Furthermore, I am experienced in conducting hydrological modeling studies to understand climate variability/change impacts on water resources and flow regimes.

Patent

Innovative Rainfall Simulator for moving storm conditions (Patent # 471419). Government of India

[Google Scholar](#); [Linkedin](#); [Orcid](#)

Employment History

2024	-	2026	Head, Dept., of Hydrology, IIT Roorkee, Uttarakhand, India.
2023	-	Present	Professor, Dept., of Hydrology, IIT Roorkee, Uttarakhand, India.
2021	-	2024	Head, Centre of Excellence in Disaster Mitigation and Management, IIT Roorkee, Uttarakhand, India.
2018	-	2023	Associate Professor, Dept., of Hydrology, IIT Roorkee, Uttarakhand, India.
2012	-	2018	Assistant Professor, Dept., of Hydrology, IIT Roorkee, Uttarakhand, India.
2011	-	2012	Fellow, Ashoka Trust for Research in Ecology and The Environment, Gangtok, Sikkim, India.
2009	-	2011	Post-doctoral Fellow, Biosystems Engineering Department, Auburn University, Auburn, AL, USA.
2005	-	2009	Graduate Research Assistant, Biosystems Engineering Department, Auburn University, Auburn, AL, USA.
2002	-	2004	Graduate Research Assistant, Bio. and Agri. Engr., University of Arkansas, Fayetteville, AR, USA.

Research & Consultancy Projects (Funding >700,000 USD equivalent to 6+ crore INR)

International Projects & Funding

2022	-	2025	PI: Probabilistic floods and sediment transport forecasting in the Himalayas during the extreme events (DST, Indo-Italy Bilateral Project) (₹34.09 Lakhs)
2021	-	2023	PI: Development and Implementation of Science-based Springshed Management in the Indian Himalayan Region (ICIMOD, Nepal; Swiss Dev. Coop.) (₹30.81 Lakhs)
2020	-	2021	PI: Lidar based non-contact hydrometry for mountainous terrain (World Meteorological Organization WMO) (₹55.40 Lakhs)
2019	-	2021	PI: Climate proofing of Springshed development program through science & technology interventions in drought probe areas of Sikkim. (United Nations Development Program, UNDP) (₹28.80 Lakhs)
2019	-	2019	PI: Assessing the impact of changing pine-oak forest dynamics on hydrology and water quality in the Lesser Himalayas. (Institute of Global Innovation Water Challenges Project, Univ. of Birmingham, UK) (₹7000)
2019	-	2019	PI: Water quality dynamics under changing land use in the Himalayas India. (₹5000)

National Projects & Funding

2022	-	2025	PI: Monitoring and Assessment of Mountain Ecosystem and Services in North-West Himalaya: Monitoring and Modelling of Hydro-Glaciological Processes in Glaciated and Non-glaciated Watershed (IIRS, ISRO, India) (₹24.01 Lakhs)
2021	-	2023	PI: Spring Rejuvenation for Water Security in Mizoram: A Pilot Student for the Selected Villages of the Mengpui Basin (IWRD, Mizoram Government .) (₹16.94 Lakhs)
2019	-	2023	Co-PI: Pine-Oak Ecosystem: Interactions with Water-Climate-Chemistry (Min. of Water Resources, Government of India) (₹61.42 Lakhs)
2020	-	2023	Co-PI: Comparing the Disparate Impacts of Oak and Chir Pine Tree Species on their Local Hydrological and Hydroclimatic Regimes in the West-Central Himalayas (STARS, Government of India) (₹32.52 Lakhs)
2019	-	2023	Co-PI: Hydro-geological Assessment and Socio-Economic Implications of Depleting Water Resources in Nainital (Min. of Water Resources, Government of India) (₹70.35 Lakhs)
2019	-	2023	PI: Unravelling the Hydrology of Himalayan Catchment through High Resolution Hydrological Data (NMHS, MoEF&CC; India) (₹15.36 Lakhs)
2018	-	2021	Co-PI: Water Security through Community Based Springshed Development in the IHR (National Mission on Himalayan Studies, MoEF&CC, India; (₹23.31 Lakhs)
2017	-	2020	PI: Development of Field Demonstration Site for Revisiting Rainfall Measurement: An Undercatch Issue (Ministry of Water Resources, River Development and Ganga Rejuvenation, CWC, DRIP, India) (₹40 Lakhs)
2017	-	2018	PI: Citizens Science Approach for the revival of dying spring (Uttarakhand Government, Water for Welfare Initiative, IIT Roorkee, Uttarakhand, India) (₹4 Lakhs)

- 2013 - 2017 PI: Understanding Hydrogeological Processes and Their Impacts on Water Security in the Tehri- Garhwal Region of Uttarakhand (IIT Roorkee, Uttarakhand, India) (**₹9.5 Lakhs**)
- 2014 - 2017 PI: Understanding Relationship between Infiltration Tradeoff Hypothesis and Surface Runoff Generation Mechanisms (SERB, DST, India) (**₹11.50 Lakhs**)

Consultancy Projects & Funding

- 2021 - 2023 PI: Spring Rejuvenation for Water Security in Mizoram (IWRD, Mizoram Government, India.) (**₹14.99 Lakhs**)
- 2021 - 2023 PI: An Early Warning System to Improve Adaptive Capabilities and Resilience of Vulnerable Himalayan Communities to Extreme Rainfall and Flooding (NERC, UK) (**₹39.53 Lakhs**)
- 2020 - 2022 PI: WMO Myanmar Hydrology Training Programme (UKCEH) (**₹59.54 Lakhs**)
- 2019 - 2021 PI: Climate proofing of springshed development program through S&T interventions in drought prone areas of Sikkim (UNDP) (**₹16.52 Lakhs**)

Short-term Courses & Workshops Conducted

- 2020 WMO Hydrology Training Module: Principles of Hydrology, Myanmar
- 2019 River Discharge Estimation Using Non-Contact Hydrometric Techniques, India
- 2018 Brainstorming Training-cum-Workshop on State-of-the-Art Hydrometric Data Acquisition and Transmission Networks, Measurements and Modelling in collaboration with IRPI, Italy; USGS, Boulder, USA and UKCEH, UK
- 2017 Urban Stormwater Management: Science, Policy, and Engineering Training for SMART CITIES in collaboration Woolpert Inc., South Carolina, USA
- 2016 BASINS/HSPF Training Workshop in collaboration with Aquaterra Inc., California, USA

Teaching Experience (Avg. faculty score 4.5/5.0 at Institute-level)

- 2012 - Present Watershed Behavior and Conservation Practices (Grad-level; student enrollment # ~20)
- 2013 - 2021 Engineering Hydrology (Undergrad-level; student enrollment # ~60)
- 2016 - Present Hydrological Data Collection and Analysis (Grad-level; student enrollment # ~10)
- 2016 - Present Watershed Modelling and Simulation (Grad-level; student enrollment # ~12)
- 2013 Hydrometeorology (Grad-level; student enrollment # ~15)
- 2013 - 2023 Experiment Hydrology (Grad-level; student enrollment # ~20)

International Collaborations

1. 2019: Biose State University, USA, Geosciences Dept.: Dr. James P. McNamara
2. 2020: The Pennsylvania State University, USA, Dept. of Agricultural and Bio. Engineering: Dr. Cibin Raj

3. 2020: University of Connecticut, USA, College of Agri., Health & Natural Resources: Dr. Indrajeet Chaubey
4. 2021: University of Maryland, USA, College of Agriculture & Natural Resources: Dr. Puneet Srivastava
5. 2018: University of Birmingham, UK, School of Geography, Earth & Environ. Sciences: Dr. David Hannah
6. 2017: UK Centre for Ecology & Hydrology: Dr. Harry Dixon
7. 2017: Cranfield University, UK: Dr. Andrea Momblanch
8. 2016: IRPI-CNR, Italy: Dr. Tommaso Moramarco\

Doctoral Thesis Supervised

S. No.	Thesis Title	Status	Candidates Name	Supervisor/ Co-supervisor
1.	Deciphering Hydrological Responses of Springflow Systems in the Lesser Indian Himalayas	Awarded (2024)	Bhargabnanda Dass	Sumit Sen
2.	Flow Resistance and Sediment Transport in High-gradient Streams	Awarded (2024)	Anshul Yadav	Sumit Sen
3.	Understanding Hydrological Processes of Lesser Himalayan Hillslopes	Awarded (2021)	Aliva Nanda	Sumit Sen
4.	Hydrologic Impacts of Climate and Anthropogenic Changes on an Ethiopian Rift Valley Lake	Awarded (2020)	Mulugeta Musie Abdi	Sumit Sen
5.	Modeling Moisture Flow in Root Zone: Estimation of Root Water Uptake and Soil Hydraulic Parameters	Awarded (2019)	Ickkshaanshu Sonkar	Co-supervisor with Dr. K.S. Prasad Hari
6.	Hydrological Response of an Experimental Watershed of Lesser Himalaya	Awarded (2018)	Vikram Kumar	Sumit Sen
7.	Planning of Inter-basin Transfer for Sustainable Water Management in Ethiopia	Awarded (2017)	Dereje Adeba Gerbi	Co-supervisor with Dr. M. L. Kansal

Peer-reviewed Publications (*indicates the corresponding author)

(Citations: 1133; h-index: 19)

1. Dass, B., Rao, S. M., **Sen, S***. Hydrogeochemical characterization and water quality assessment of mountain springs: Insights for strategizing water management in the lesser Indian Himalayas. *Journal of Hydrology: Regional Studies*, 57, 102126. **2025** doi.org/10.1016/j.ejrh.2024.102126
2. Sharma, S., Prashanth, S. S., Sharma, A*, **Sen, S.** Spatial heterogeneity of ecosystem services and their valuation across Himalayas: a systematic literature review and meta-analysis. *Environmental Research Letters*, 20, 20 013002, doi 10.1088/1748-9326/ad9abc, **2024**.
3. Kumar, M., **Sen, S.**, Kulkarni, H., Badiger, S., Varma, G. R., Krishnaswamy, J. Ecohydrological and hydrogeological dynamics of groundwater springs in Eastern Himalaya, India. *Groundwater for Sustainable Development*, 27, 101311, doi.org/10.1016/j.gsd.2024.101311. **2024**.

4. Bahmanpouri, F., Yadav, A., Massari, C., Santis, D. De., Sharma, A., Agarwal, A., **Sen, S.**, Fraccarollo, L., Moramarco, T., Barbetta, S. Application of the Entropy Model to Estimate Flow Discharge and Bed Load Transport with Limited Field Measurements. *Water*, 16(24), 3684. <https://doi.org/10.3390/w16243684>. **2024**.
5. Shah, S., **Sen, S***, Sahoo, D. State of Indian Northwestern Himalayan Lakes under Human and Climate Impacts: A Review, *Ecological Indicators*, 160, 111858, **2024**.
6. Yadav, A., Hassan, M. A., McDowell, C., Bradley, D. N., **Sen, S.** Fluvial dispersion of coarse bed particles: Insights from the field observations and simulation model. *Water Resources Research*, 60 (11), e2023WR036427 **2024**.
7. Yadav, A., **Sen, S.**, Mao, L., Hassan, M. A. Estimation of bed material transport in gravel-bed streams using the virtual velocity approach: Insights from the North-western Himalayas, India. *Earth Surface Processes and Landform*, 49 (11), 3367-3382, **2024**.
8. Sangin, E., Patil, P. R., Mishra, S. K., **Sen, S.** Proficiency of probability distributions in unit hydrograph derivation. *Hydrology Research*, nh2024151. doi.org/10.2166/nh.2024.151. **2024**.
9. Subramanian, S. S., Srivastava, P., Yunus, A. P., Martha, T. R., **Sen, S.** Numerical model derived intensity-duration thresholds for early warning of rainfall-induced debris flows in the Himalayas. *NHESS*, February, 24 (2), 465-480, **2024**.
10. Kumar, V*, and **Sen, S.** Rating curve development and uncertainty analysis in mountainous watersheds for informed hydrology and resource management. *Front. Water* 5:1323139. **2024**
11. Kumar, V*, and **Sen, S.** Hydrometeorological field instrumentation in Lesser Himalaya to advance research for future water and food security. *Environ Monit Assess.*, 195:1162. **2023**
12. van de Giesen, N*, Peña Haro, S*, **Sen, S***. WMO HydroHub Innovation Snapshot: Introduction to Non-Contact Technologies for Hydrometry. *WMO HydroHub*, Issue 1, **2023**.
13. Dass, B., Daniel, D., Saxena, N., Sharma, A., Sen, D., **Sen, S***. Informing watershed management in data-scarce Indian Himalayas. *Water Security Journal* 19, 100138, **2023**.
14. Yadav, A., Boothroyd, R. J., Sambrook Smith, G. H., **Sen, S.** Morphological adjustments of the Yamuna River in the Himalayan foothills in response to natural and anthropogenic stresses. *Hydrological Processes*, 37:e14934, <https://doi.org/10.1002/hyp.14934>, **2023**.
15. Mukherjee, S., **Sen, S.**, Kumar, K. Multifactor prediction of the central Himalayan spring high-flows using machine learning classifiers. *Environmental Earth Sciences*, 82: 85, **2023**
16. Yasmin, T., Khamis, K., Ross, A., Sen, S., Sharma, A., Sen, D., **Sen, S.**, Buytaert, W., Hannah, D. Brief Communication: Inclusiveness in designing early warning system for flood resilience. *EGUSphere, NHESS*, 23 (2), 667-674 **2023**.
17. Meena, R.K., **Sen, S.***, Nanda, A., Dass, B., Mishra, A. A contribution to rainfall simulator design—a concept of moving storm automation. *Hydrology and Earth System Sciences* 26 (16), 4379-4390. **2022**.
18. Orr, A., Ahmad, B., Alam, U., **Sen, S.**, et. al. Knowledge priorities on climate change and water in the Upper Indus Basin: A horizon scanning exercise to identify the top 100 research questions in social and natural sciences. *Earth's Future* 10 (4), e2021EF002619. **2022**.
19. Jameel, M., **Sen, S.**, Perumal, M. Evaluation of Sediment Management Techniques of Dokan Dam Accomplished with Climate Change Scenarios Using ResCon 2.2 Beta Model. *Journal of Water Resources and Geosciences* 1 (1), 117-124. **2022**.

20.	Yadav, A., Sen, S. , Mao, L., Schwanghart, W. Evaluation of flow resistance equations for high gradient rivers using geometric standard deviation of bed material. <i>Journal of Hydrology</i> 605, 127292. 2022 .
21.	Anandhi, A., Srivastava, P., Mohtar, R.H., Lawford, R.G., Sen, S. , Lamba, J. Methodologies and Principles for Developing Nexus Definitions and Conceptualizations: Lessons from FEW Nexus Studies. <i>Journal of the ASABE</i> . 2022 .
22.	Kumar, M*, Hodnebrog, Ø., Daloz, A. S., Sen, S. , Badiger, S., & Krishnaswamy, J. Measuring precipitation in Eastern Himalaya: Ground validation of eleven satellite, model and gauge interpolated gridded products. <i>Journal of Hydrology</i> , 599, 126252.2021. 2021 .
23.	Dass, B., Sen, S* , Bamola, V., Sharma, A., & Sen, D. Assessment of spring flows in Indian Himalayan micro-watersheds—A hydro-geological approach. <i>Journal of Hydrology</i> , 598, 126354.2021. 2021 .
24.	Kumar, V*, Sen, S. , & Chauhan, P. Geo-morphometric prioritization of Aglar micro watershed in Lesser Himalaya using GIS approach. <i>Modeling Earth Systems and Environment</i> , 7(2), 1269-1279. 2021 .
25.	Dass, B., Sen, S* , Sharma, A., Hussain, S., Rana, N., & Sen, D. Hydrological process monitoring for springshed management in the Indian Himalayan region: field observatory and reference database. <i>Current Science</i> (00113891), 120(5). 2021 .
26.	Daniel, D., Anandhi, A., & Sen, S* . Conceptual Model for the Vulnerability Assessment of Springs in the Indian Himalayas. <i>Climate</i> 9(8), 121. 2021 . https://doi.org/10.3390/cli9080121
27.	Musie, M., Momblanch, A., Sen, S* . Exploring future global change-induced water imbalances in the Central Rift Valley Basin, Ethiopia. <i>Climatic Change</i> , 164:47, doi.org/10.1007/s10584-021-03035-x. 2021 .
28.	Musie, M., Sen, S* , Srivastava, P. Application of CORDEX-AFRICA and NEX-GDDP datasets for hydrologic projections under climate change in Lake Ziway sub-basin, Ethiopia. <i>Journal of Hydrology: Regional Studies</i> , 31, 100721. 2020 .
29.	Nanda, A., Sen, S* , Sharma, A. N., & Sudheer, K. P. Soil Temperature Dynamics at Hillslope Scale—Field Observation and Machine Learning-Based Approach. <i>Water</i> , 12(3), 713, 2020 . (Invited)
30.	Kumar, V., Sen, S* . Assessment of spring potential for sustainable agriculture: A case study in lesser Himalayas. <i>Applied Engineering in Agriculture</i> , 36(1), 11-24, 2020 .
31.	Musie, M.; Sen, S* . Chaubey, I. Hydrologic Responses to Climate Variability and Human Activities in Lake Ziway Basin, Ethiopia. <i>Water</i> , 12, 164, 2020 .
32.	Musie, M., Sen, S* , Srivastava, P. Comparison and Evaluation of Open Source Precipitation Datasets for Streamflow Simulation in Data Scarce Watersheds of Ethiopia. <i>Journal of Hydrology</i> , 579, 124168. 2019 . https://doi.org/10.1016/j.jhydrol.2019.124168 .
33.	Nanda, A., Sen, S* , McNamara, J.P. How spatiotemporal variation of soil moisture can explain hydrological connectivity of infiltration-excess dominated hillslope: Observations from Lesser Himalayan Landscape, <i>Journal of Hydrology</i> , 579, 124146, 2019 .
34.	Sonkar, I., Kotnoor, H. P., Sen, S . Estimation of Root Water Uptake and Soil Hydraulic Parameters from Root Zone Soil Moisture and Deep Percolation. <i>Agricultural Water Management</i> , 222:38-47, 2019 .

35.	Bhattaraia N., Mallick, K., Stuarda, J., Vishwakarma, B. D., Niraula, R., Sen, S. , Jain, M. An automated multi-model evapotranspiration mapping framework using remotely sensed and reanalysis data. <i>Remote Sensing of Environment</i> , 229: 69-92. 2019 .
36.	Nanda, A., Sen, S* , Jirwan, V., Sharma, A., Kumar, V. Understanding Plot-Scale Hydrology of Lesser Himalayan Watershed- A Field Study and HYDRUS-2D Modeling Approach. <i>Hydrological Processes</i> , 32(9): 1254-1266, 2018 .
37.	Pati, A., Sen, S* , Perumal, M. Modified Channel Routing Scheme for SWAT Model. <i>Journal of Hydrologic Engineering</i> ASCE, DOI 10.1061/(ASCE)HE.1943-5584.0001657, 2017 .
38.	Shah, A.I., Sen, S. , Dar, M.U.D., Kumar, V. Land-Use/ Land-Cover Change Detection and Analysis in Aglar Watershed, Uttarakhand. <i>Current Journal of Applied Science and Technology</i> , 24(1): 1-11, 2017 .
39.	Kumar, V., Sen, S* . Evaluation of Spring Discharge Dynamics using Recession Curve Analysis: A Case Study in Data-Scarce Region, Lesser Himalayas, India. <i>Sustainable Water Resources Management</i> , DOI: 10.1007/s40899-017-0138-z, 2017 .
40.	Noori, N., Kalin, L., Sen S. , Srivastava P., Lebleu, C. Identifying Areas Sensitive to Land Use/ Land Cover Change for Downstream Flooding in a Coastal Alabama Watershed. <i>Regional Environmental Change</i> , 16(6): 1833–1845, 2016 .
41.	Adeba, D., Kansal, M.L., Sen, S. Economic Evaluation of Proposed Alternatives of Inter-basin Water Transfer from BaroAkobo to Awash Basin in Ethiopia. <i>Sustainable Water Resources Management</i> , 2(3): 313-330, 2016 .
42.	Madolli, M.J., Sen, S. , Jain, M.K. Trends in Temperature and Precipitation for the Karnataka State, India. Indian Association of Hydrologist, <i>Hydrology Journal</i> , 37(1-4): 61-70, 2015 .
43.	Adeba, D., Kansal, M.L., Sen, S. Assessment of Water Scarcity and its Impacts on Sustainable Development in Awash Basin, Ethiopia. <i>Sustainable Water Resources Management</i> , 1(1): 71-87, 2015 .
44.	Madolli, M.J., Sen, S. , Shinde, A. Effect of Climate Change on Rainfall Pattern and Socioeconomic Condition for Karnataka State. <i>Proceedings of International conference entitled “Green India: strategic knowledge for combating climate change-prospects and challenges.”</i> 304-312, 2014 .
45.	Lamba, J., Way, T.R., Srivastava, P., Sen, S. , Wood, C.W., Yoo, K.H. Nutrient Loss in Leachate and Surface Runoff from Surface-Broadcast and Subsurface-Banded Broiler Litter. <i>J. Environmental Quality</i> , 42: 1574-1582, 2013 .
46.	Lamba, J., Way, T.R., Srivastava, P., Sen, S. , Wood, C.W., Yoo, K.H. Surface Transport of Nutrients from Surface-Broadcast and Subsurface-Banded Broiler litter. <i>Trans. of ASABE</i> . 55(3): 979-985, 2012 .
47.	Sen, S* , Srivastava, P., Vadas, P.A., Kalin, L. Watershed-level comparison of predictability and sensitivity of two phosphorus models. <i>J. Environmental Quality</i> , 41:1642-1652, 2012 .
48.	Sen, S* , Srivastava, P., Dane, J.H., Meng, H., Clement, P.T. Application of HIRO2 Hydrologic Model for Simulating Hortonian Overland Flow on a Pasture Hillslope in North Alabama. <i>J. Soil & Water Conservation</i> , 66(6): 411-422, 2011 .
49.	Sen, S* , Srivastava, P., Dane, J.H., Yoo, K.H., Shaw, J.N. Spatial-temporal variability and hydrologic connectivity of runoff generation areas in a North Alabama pasture - implications for phosphorus transport. <i>Hydrological Processes</i> , 24(3): 342-356, 2010 .

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| 50. | Sen, S* , Srivastava, P., Yoo, K.H., Dane, J.H., Shaw, J.N., Kang, M.S. Runoff Generation Mechanisms in Pastures of the Sand Mountain Region of Alabama – A Field Investigation. <i>Hydrological Processes</i> , 22(21): 4222-4232, 2008 . |
| 51. | Sen, S. , Haggard, B.E., Chaubey, I., Brye, K.R., Costello, T.A., Matlock, M.D. Sediment Phosphorus Release at Beaver Reservoir, Northwest Arkansas, USA, 2002–2003: A Preliminary Investigation. <i>Water Air & Soil Pollution</i> , 179: 67–77, 2007 . |

Invited Talks in Conferences

National

1. **S. Sen.** Expert lecture on "Spring Instrumentation Hydrology – Experiences from Research Studies at the Ministry of Jal Shakti, New Delhi, 31 Jan, **2023**.
2. **S. Sen.** Keynote lecture on "Advances in the monitoring of forest hydrological processes" at the Forest Research Institute, Dehradun on 18th Feb. **2022**.
3. **S. Sen.** Delivered a lecture on “Ground Water Perspectives- Information and Knowledge from the Hidden Underground Flows”. University of Kashmir, March **2022 (World Water Day)**.
4. **S. Sen.** Delivered a public talk on "Prioritization of Land Parcels for Capturing Rainwater: Two Case Studies of Contrasting Biogeographic Regions." Aligarh Muslim University, India, 7th July **2021**
5. **S. Sen.** Invited lectures on "Fundamentals of Springshed Management: Water security through science-based participatory approach" online training program on Long-term sustainability, security, recharge, and management of drinking water sources, 5th October & 15th December, Dehradun, India, **2021**
6. **S. Sen.** Invited talk on "Terrestrial Water Budget: The Himalayan Region” during a workshop on Himalayan Biosphere-Atmosphere-Hydrosphere Interactions: Status, Challenges, and Way Forward under National Mission of Himalayan Studies (NMHS), MoEFCC, GoI, Almora, India December 14, **2021**.
7. **S. Sen.** Raghuwanshi, S. Subregional Relationship of IOD and ENSO with ISMR and EREs for the period 1951-2007. *Developing Hydro-climatic Services for Water Security*. IUKWC, IITM, Pune, Maharashtra, India 28 Nov – 1 Dec., **2016**.
8. **S. Sen.** Hydrologic Ecosystem Services in Relation to the Himalayas. *Recent Engineering Trends on Energy Environment & Ecology, (RETEEE-14)*, Rajshree Institute of Management & Technology Bareilly, Uttar Pradesh, India Sept., 27-28, **2014. (Invited Talk)**

International

9. **S. Sen.** Invited lecture on Analyzing Water Dynamics and Mitigating Hazards through the **HILLTOP: “Himalayan Instrumentation Laboratory and Long-Term Hydrological Pathways Observatories”** at 28th General Assembly of the International Union of Geodesy and Geophysics (IUGG), Berlin, Germany, **2023**.
10. **S. Sen.** Delivered a lecture on “Operationalizing LIDAR-based non-contact water level monitoring in the Indian Himalayas”. Innovation Workshop **WMO HydroHub Phase II Innovation Roadmap**. Geneva, Switzerland, Feb. **2022**.
11. Kumar V., **Sen, S.** Developing an Instrumented Watershed in the West Himalayas, India: Needs and Challenges for Hydrologic Sciences. *ASABE Annual International Meeting*, New Orleans, Louisiana, USA, July 26-29, **2015**.

Research Presentations in Conferences

National

12. Kumar, V., **Sen, S.** Optimal crop planning under the constraint of area and water demand using multi-objective programming. *Global Water Security for Agriculture and Natural Resources*. Hyderabad, Telangana, India Oct., 3-6, **2018**.
13. Shah, A., **Sen, S.** Landuse/Landcover change in Aglar watershed (Tehri-Garhwal district, Uttarakhand): Is it Manmade or natural. *11th Uttarakhand State Technology Congress*, Dehradun, India March 2-4, **2017**.
14. Kumar, V., **Sen, S.** Morphometric Analysis of Lesser Himalaya: A Case Study of Aglar Watershed. *HYDRO International-2016*, Pune, India Dec., 08-10, **2016**.
15. Kumar, V., **Sen, S.** Analysis of Spring Discharge in the Lesser Himalaya: A Case Study of Mathamali Spring, Aglar Watershed, Uttarakhand. *International Conference on Water, Environment, Energy and Society, (ICWEES-2016)*, Jointly organized by Texas A & M University, Texas, USA and AISECT University, Bhopal, India 15-18 March 15-18, **2016**.
16. Madolli, M.J., **Sen, S.**, Shinde, A. Effect of Climate Change on Rainfall Pattern and Socioeconomic Condition for Karnataka State. *Proceedings of International conference entitled "Green India: strategic knowledge for combating climate change-prospects and challenges."* 304-312, Hyderabad, India, Dec., 05-07, **2013**

International

17. Nanda, A., **Sen, S.** Interactions between Hillslope-Scale Hydrological Fluxes: A Case Study from Lesser Himalayan Landscapes. *AGU Fall Meeting*, San Francisco, California, USA, Dec., 9-13, **2019**.
18. Sen, D., **Sen, S.** Hydro-geology based Revival of Drying Springs through Community Participation: A case Study from the Indian Himalayan Region. *Asian Ministerial Conference on Disaster Risk Reduction 2018 (AMCDRR)*, Mongolia, July, 3-6, **2018**.
19. Nanda, A., **Sen, S.** Identifying Runoff Generation Mechanisms and Its Controlling Parameters in the Lesser Himalayan Hillslopes. *AGU Fall Meeting*, New Orleans, Louisiana, USA, Dec., 11-15, **2017**.
20. Raghuwanshi, S., **Sen, S.** Subregional Relationship of IOD and ENSO with ISMR and EREs for the period 1951-2007. *ASABE Annual International Meeting*, New Orleans, Louisiana, USA, July 26-29, **2015**.
21. Jirwan, V. **Sen, S.** Characteristics of overland flow generation on two steep hillslopes in the Western Himalayas, India. *ASABE Annual International Meeting*, New Orleans, Louisiana, USA, July 26-29, **2015**.
22. **Sen, S.** Shinde, A. Hydrological modeling of critical source areas of soil erosion in the Gadarwara Watershed (India). *21st Century Watershed Technology Conference and Workshop*, Hamilton, New Zealand, Nov., 03-07, **2014**.
23. **Sen, S.**, Kumar, V., Kumar, R. Static and Dynamic Response of Hydrologic Characteristics on Spring Discharge in the Tehri-Garhwal Region of Uttarakhand. *Conference on Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014)*, organized by Indian Association of Soil and Water Conservationists (IASWC) and Central Soil and Water Conservation (CSWCRTI, ICAR), Dehradun, Uttarakhand, India March 22-24, **2014**.
24. **Sen, S.**, Srivastava, P., Lamba, J., Way, T. Modeling Phosphorus Transport in Soil and Water Using HYDRUS-1D Model. Paper # 1008607, *ASABE Annual International Meeting* Providence, Pittsburgh, PA, USA, June 20-23, **2010**.

25. **Sen, S.**, Srivastava, P. Watershed level Benefits of Alabama PIndex: A Comparison of Predictability and Sensitivity of Two Phosphorus Models. *Annual Alabama Water Resources Conference*, Orange Beach, AL. USA Sept., 9-11, **2009**.
26. **Sen, S.**, Srivastava, P. Evaluating Effectiveness of Alabama P-Index in a Poultry Litter Applied Watershed Using SWAT and a State-of-the-Art Manure Phosphorus Model. Paper # 096188, *ASABE Annual International Meeting*, Reno, NV, USA June 21–24, **2009**.
27. Lamba, J., Way, T., Srivastava, P., Wood, W., **Sen, S.** Gupta, A. Subsurface Transport of Phosphorous from Surface- and Subsurface-Applied Poultry Litter. Paper# 096899, *ASABE Annual International Meeting*, Reno, NV, USA June 21–24, **2009**.
28. Lamba, J., Srivastava, P., Way, T., **Sen, S.**, Gupta, A., Wood, W. Surface Transport of Phosphorus from Surface- and Subsurface-applied Poultry Litter. Paper# 096893, *ASABE Annual International Meeting*, Reno, NV, USA June 21–24, **2009**.
29. **Sen, S.**, Srivastava, P., Dane, J.H., Yoo, K.H., Shaw, J.N. Spatial-Temporal Variability and Hydrologic Connectivity of Runoff Generation Areas in Sand Mountain Region of Alabama. Oral presentation. Paper# 083806, *ASABE Annual International Meeting*, Providence, RI, USA June 21–24, **2008**.
30. **Sen, S.**, Srivastava, P., Dane, J.H., Yoo, K.H., Shaw, J.N. Spatial-Temporal Variability and Hydrologic Connectivity of Runoff Generation Areas in a North Alabama Region. Poster presentation. *Annual Conference of the Soil and Water Conservation Society-Alabama Chapter*. Auburn, AL, USA June, **2008**. (**2nd place award**)
31. **Sen, S.**, Srivastava, P., Dane, J.H., Yoo, K.H., Shaw, J.N., Kang, M.S. Runoff Generation Mechanism in the Appalachian Plateau Region of Alabama – A Field Investigation. Oral presentation. Paper# 072090, *ASABE Annual International Meeting*, Minneapolis, Minnesota, USA June 17–20, **2007**.
32. **Sen, S.**, Haggard, B.E., Chaubey, I., Matlock, M.D., Costello, T.A., Brye, K.R. Phosphorus flux from reservoir bottom sediments at Beaver Lake, Arkansas. Poster presentation. *Auburn University Earth Day*, Auburn, AL, USA. April, **2005**. (**1st place award**)

Outreach/Extension Timely Information Sheet

1. **Sen, S.**, **Sen**, Way, T.R., Srivastava, P., Lamba, J., Stanford, M.K. Water Quality Benefits of Subsurface-Banded Poultry Litter. Biosystems Engineering Series, *Timely Information Sheet, Agriculture & Natural Resources, Alabama Cooperative Extension System*, **2010**.
2. **Sen, S.**, Srivastava, P., Yoo, K.H., Stanford, M.K. Pasture Hillslope Hydrology of the Sand Mountain Region in North Alabama. *Biosystems Engineering Series, Timely Information Sheet, Agriculture & Natural Resources, Alabama Coop. Extension System*, **2010**.

Technical Reports

1. Worked as draft committee member on the NITI Aayog report focused on “Inventory and Revival of Springs in Himalayas for Water Security”, DST, New Delhi. **2018**.
2. **Sen, S.**, Momblanch, A. Ecosystem Services Assessment and its Implementation in UK. Report of Researcher Exchange May15–June 2, **2017**.
3. Chaubey, I., Matlock, M., Costello, T. A., Haggard, B. E., Garg, V., **Sen, S.**, White, K. L., Davis, R. K. (2005) Development of a Decision Support System and Data Needs for the Beaver Lake Watershed. Prepared for Arkansas Soil & Water Cons. Comm.

Book Chapters

1. Kumar V., **Sen S.** Analysis of Spring Discharge in the Lesser Himalayas: A Case Study of Mathamali Spring, Aglar Watershed, Uttarakhand. *In: Singh V., Yadav S., Yadava R. (eds) Water Resources Management*. Water Science and Technology Library, vol 78. Springer, Singapore, **2018**.
2. Panda, S.S., Mason, E., **Sen, S.**, Kim, H.W., Amatya, D.M. Forest Hydrology Management Decision Support with Geospatial Technology. *Chapter in Forest Hydrology*. CAB International, Nosworthy Way, Wallingford OX10 8DE, United Kingdom, **2016**.

Professional Memberships

1. American Society of Agricultural and Biological Engineering, member since 2002
2. American Geophysical Union, member since 2006
3. American Water Resources Association, member: 2002-2008
4. Alpha Epsilon, Honor Society of Agricultural, Food and Biological Engineering, member since 2003
5. Gamma Sigma Delta, Honor Society of Agriculture, member since 2003
6. Indian Water Resources Society, life member since 2012
7. Indian Association of Hydrology, life member since 2012

Professional Activities & Services

1. Conducts awareness program for local communities and non-profit organizations on water conservation and measurement.
2. Serving on various National and State-level committees for Watershed Management and River Rejuvenation.
3. Served as an External Reviewer of research manuscripts prior to publishing in the following journals-
 - i. Transactions of the ASABE
 - ii. Journal of Hydrologic Engineering, ASCE
 - iii. Journal of Hydrology
 - iv. Environmental Modelling and Software
 - v. Hydrological Processes
 - vi. Indian Society of Hydraulics ISH
 - vii. Indian Society of Remote Sensing ISRS
4. Served as an Internal reviewer for the US Department of Agriculture manuscript.
5. Served as the research proposal reviewer for the Dept. of Science & Technology, Government of India.
6. Served as a Session Moderator at the Annual International Meeting, Soil and Water Division Poster and Oral Session, Hydrology Group (SW-21).

Honors & Awards

1. Young Scientist Research Grant, Department of Science & Technology, Government of India
2. Young Scientist International Travel Grant, Department of Science & Technology, Government of India
3. Indo-UK Water Centre Researcher Exchange Grant
4. The College of Agriculture' 2009 Outstanding International Graduate Student Award, Auburn University, Alabama, USA
5. Poster awards at the Annual Conference of the Soil and Water Conservation Society-Alabama Chapter (2nd place) and Auburn University Earth Day (1st place)

