

# Dr. VIKAS POONIA

(Professor In-charge Water Management, MANIT Bhopal)

(Assistant Professor, Maulana Azad National Institute of Technology, Bhopal)

Ex-Postdoctoral Fellow (Indiana University Purdue University, USA and IISc Bangalore)

[vgpcivilengineer@gmail.com](mailto:vgpcivilengineer@gmail.com), [vpoonia@manit.ac.in](mailto:vpoonia@manit.ac.in)

Phone: +91-8112210590

Department of Civil Engineering

Maulana Azad National Institute of Technology Bhopal

Bhopal, Madhya Pradesh

India 462003

21A-Indira Vilas

Sainik Colony, Sadulpur

Churu District

Rajasthan, 331023

## RESEARCH INTEREST

Drought and heatwave monitoring, Compound flooding, Flash drought and forecasting, Climate change impact assessment, Extreme events, Risk and resilience assessment, Crop modelling

## SKILLS

Copula Analysis, MATLAB and R-coding, Aqua Crop and CROPWAT modelling

## TEACHING SUBJECTS

Fluid Mechanics, Hydrology, Irrigation Engineering, Fluid Mechanics Laboratory

## EDUCATION

### Indian Institute of Technology Indore

Indore, MP, India

PhD (Doctoral Research)

Dec 2018- Jan 2022

Hydro-climatology Lab, Department of Civil Engineering

PhD Guide: Prof. Manish Kumar Goyal

PhD Thesis: Droughts: Occurrence, Evolution and Impacts over India

**Description:** The goal of my PhD work is to explore the occurrence, distribution, concurrence and evolution of all major drought types and assessment of their impact over India. Broadly,

- Occurrence, Concurrence, and Evolution of Meteorological, Hydrological and Agricultural Droughts over River Basins of India
- Copula based analysis of meteorological, hydrological and agricultural drought characteristics across Indian river basins
- Terrestrial ecosystem response to flash droughts over India
- Understanding the impact of climate change on crop yield and crop water requirement of major crops in Sikkim, Himalayan region of northeast India.

### Maulana Azad National Institute of Technology (MANIT)

Bhopal, India

Master of Technology

2016-2018

(Water Resource Engineering)

Department of Civil Engineering

M. Tech Guide: Dr. H.L. Tiwari

**M. Tech Thesis:** Rainfall-Runoff Modelling for the Hoshangabad Basin of Narmada River Using Artificial Neural Network

**Description:** Develop an ANN-based rainfall-runoff model for the Hoshangabad catchment of the Narmada River in Madhya Pradesh.

### BRCM College of Engineering and Technology (BRCM-CET)

Bahal, India

Bachelor of Technology

2011-2015

Department of Civil Engineering (Advisor: Dr. Arabinda Sharma)

## WORK EXPERIENCE

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<b>Maulana Azad National Institute of Technology Bhopal</b> Assistant Professor Department of Civil Engineering	Bhopal, India Jan 2024- Present
<b>National Institute of Technology Calicut</b> Assistant Professor Department of Civil Engineering	Calicut, India Sept 2023- Jan 2024
<b>Indiana University-Purdue University (IUPUI), USA</b> Post-Doctoral Fellow Department of Earth Sciences	Indianapolis, USA Nov 2022- Sept 2023
<b>Indian Institute of Science, Bangalore</b> IoE Post-Doctoral Fellow Interdisciplinary Centre for Water Research (ICWaR)	Bengaluru, India Mar 2022- Oct 2022
<b>Indian Institute of Technology, Indore</b> Teaching Assistant Hydro-climatology Lab, Department of Civil Engineering	Indore, MP, India Dec 2018- Jan 2022
<b>Indian Institute of Technology, Indore</b> Senior Research Fellow Hydro-climatology Lab, Department of Civil Engineering	Indore, MP, India Aug 2018- Dec 2018
<b>Maulana Azad National Institute of Technology, Bhopal</b> Teaching Assistant Department of Civil Engineering	Bhopal, MP, India Jul 2016 -June 2018

## FELLOWSHIPS AND AWARDS

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- **G.M. Nawathe Puraskar 2024-** Analytical Category Best Paper presented in Hydro- 2023 International at NIT, Warangal for the year 2024 by the Indian Society for Hydraulics (ISH) at HYDRO-2022, 29<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the **CWPRS, Pune** held during 18-20 December, 2024.
- **Best paper award** at HYDRO-2023, 28<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the Department of Civil Engineering, **National Institute of Technology, Warangal NITW**, held during 21-23 December, 2023.
- **Best paper award** at International Water Conference for Sustainable Development Goals (IWCSDG-2024), organized by Department of Civil Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal, Madhya Pradesh during March 22-23, 2024.
- **SYSTA: Sivapalan Young Scientists Travel Award** by the International Association of Hydrological Sciences (IAHS) to attend the 12<sup>th</sup> International Workshop on Statistical Hydrology (STAHY2022), Chia, Sardinia, Italy during 17-20 September 2022.
- **Prof. U. C. Kothiyari Best PhD Thesis Award for the year 2022** by the Indian Society for Hydraulics (ISH) at HYDRO-2022, 27<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the Department of Civil Engineering, **Punjab Engineering College, Chandigarh**, held during 22-24 December, 2022.
- **Postdoctoral position received** from the **Department of Earth Sciences at the Indiana University-Purdue University Indianapolis, USA** from November 1, 2022, to December 31, 2023.
- **Institution of Eminence- IoE Postdoctoral Fellowship** by the Indian Institute of Science (IISc) Bangalore, Bengaluru Karnataka on 24 February 2022 for one year.
- **Best paper award** at International Conference on “Water and Environment” (ICWE-2021), organized by

Department of Civil Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal, Madhya Pradesh during March 22-23, 2021.

- **Awarded travel grant** by Madhya Pradesh Council of Science and Technology to attend 35<sup>th</sup> MP Young Scientist Congress, 28-29 February 2020, Indore, Madhya Pradesh, India
- **Young Scientist Award** at International Conference on Recent Advances in Life Sciences for Betterment of Environment and Human Health, organized by Government Holkar Science College, Indore, Madhya Pradesh, India 14-15 December 2019.
- Awarded **GOLD MEDAL** in Bachelor of Technology, Civil Engineering, BRCM-CET, May 2015.
- Awarded **Overall Academic Topper Award** for best performance in Bachelor of Technology, Civil Engineering, BRCM-CET, May 2015.
- Awarded **Best Outgoing Student Award (Academic)** for consistent outstanding academic performance in Bachelor of Technology, Civil Engineering, BRCM-CET, 6 November 2014.

## PUBLICATIONS – Journal Papers

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- Mukherjee, A., **Poonia, Vikas**, Swarnkar, S. (2025). Assessing Compound Flood Drivers in Peninsular India: A Multivariate Copula-Based Approach, *Journal of Environmental Management*, 395, 127875, <https://doi.org/10.1016/j.jenvman.2025.127875> [Impact Factor: 8.4]
- **Poonia, Vikas**, Mukherjee, A., Singh, A.D., Swarnkar, S. (2025). Clustering-Based Assessment of Long-Term Surface Water Scarcity and Per Capita Vulnerability in Arid India, *Earth Systems and Environment*, <https://doi.org/10.1007/s41748-025-00849-y> [Impact Factor: 4.7]
- Raj, C., Swarnkar, S., **Poonia, Vikas**, and Sahu, V. (2025). Compound Extreme Dry and Hot Events in Madhya Pradesh: Temporal Shifts, Regional Hotspots, and Adaptation Strategies, *Theoretical and Applied Climatology*, 156, 333, <https://doi.org/10.1007/s00704-025-05573-1> [Impact Factor: 2.7]
- Pandey, S., Swarnkar, S., **Poonia, Vikas**, Kundu, S., and Ghosal, M. (2025). Human versus climate interactions on riverine flood characteristics in the largest Indian Peninsular basin, *Anthropocene*, 49, 100463. <https://doi.org/10.1016/j.ancene.2025.100463> [Impact Factor: 3.9]
- **Poonia, Vikas**, Jha, S., Srinivas, V.V., and Wang, L. (2024). Spatiotemporal Characteristics and Triggers of Flash Droughts across all the river basins in India, *Journal of Hydrometeorology*, 25(9), 1357-1369. <https://doi.org/10.1175/JHM-D-23-0080.1> [Impact Factor: 2.9]
- Ghosal, M., Swarnkar, S., **Poonia, Vikas**, Kundu, S., and Pandey, S. (2024). Hydrological dichotomy: Streamflow drought in dammed vs. undammed regions of the largest Indian Peninsular basin, *Journal of Arid Environments*, 225, 105273. <https://doi.org/10.1016/j.jaridenv.2024.105273> [Impact Factor: 2.5]
- Mishra, K., Tiwari, H. L., and **Poonia, Vikas**. (2024). Integrated Approach of Machine Learning Coupled with Cellular Automation for Monitoring and Forecasting of Land Use and Land Cover, *Journal of Arid Environments*, 226(3), 105293. <http://dx.doi.org/10.1016/j.jaridenv.2024.105293> [Impact Factor: 2.5]
- Goyal, M. K., **Poonia, Vikas**, and Jain, V. (2023). Three Decadal Urban Drought Variability Risk Assessment for Indian Smart Cities, *Journal of Hydrology*, 625, 130056. <https://doi.org/10.1016/j.jhydrol.2023.130056> [Impact Factor: 6.3]
- Rakkasaggi, S., **Poonia, Vikas**, and Goyal, M.K. (2023). Flash drought as a new climate threat: drought indices, insights from India's study, and implications for future research, *Journal of Water and Climate Change*, 14 (9), 3368–3384. <https://doi.org/10.2166/wcc.2023.347> [Impact Factor: 3.1]
- **Poonia, Vikas**, Goyal, M. K., Jha, S., and Dubey, S. (2022). Terrestrial ecosystem response to flash droughts over India, *Journal of Hydrology*, 605, 127402. <https://doi.org/10.1016/j.jhydrol.2021.127402> [Impact Factor: 6.3]
- **Poonia, Vikas**, Jha, S., Goyal, M.K. (2021). Copula based analysis of meteorological, hydrological and agricultural drought characteristics across Indian river basins, *International Journal of Climatology*, 41 (9), 1-16. <https://doi.org/10.1002/joc.7091> [Impact Factor: 2.8]
- **Poonia, Vikas**, Goyal, M.K, Gupta, B.B, Gupta, A.K, Jha, S. and Das, J. (2021). Drought Occurrence in Different River Basins of India and Blockchain Technology based Framework for Disaster Management, *Journal of Cleaner Production*, 312, 127737. <https://doi.org/10.1016/j.jclepro.2021.127737> [Impact Factor: 10.0]
- **Poonia, Vikas**, Das, J., and Goyal, M.K. (2021). Impact of climate change on crop water and irrigation requirements over eastern Himalayan region, *Stochastic Environmental Research and Risk Assessment*, 35,

1175–1188. <https://doi.org/10.1007/s00477-020-01942-6> [Impact Factor: 3.6]

- Kumar, N., **Poonia, Vikas**, Gupta, B.B. and Goyal, M. K. (2021). A novel framework for risk assessment and resilience of critical infrastructure towards climate change, *Technological Forecasting and Social Change*, 165,120532. <https://doi.org/10.1016/j.techfore.2020.120532> [Impact Factor: 13.3]
- Das, J., **Poonia, Vikas**, Jha, S., and Goyal, M.K. (2020). Understanding the Climate Change Impact on Crop Yield over Sikkim, India: Ascertaining GCM and Scenario Uncertainty, *Theoretical and Applied Climatology*, 142, 467-482. <https://doi.org/10.1007/s00704-020-03332-y> [Impact Factor: 2.7]
- **Poonia, Vikas**, and Tiwari, H.L. (2020). Rainfall-runoff modelling for the Hoshangabad Basin of Narmada River using artificial neural network, *Arabian Journal of Geosciences*, 13, 944. <https://doi.org/10.1007/s12517-020-05930-6> [Impact Factor: 1.327]

#### PUBLICATIONS – Journal Papers (Revision/Under Review)

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- Nath, R., Swarnkar, S., **Poonia, Vikas**, and Kurmi, V. (2025). Hybrid AI Framework for Imputation and Modelling of Remotely Sensed Surface Water in Climate-Sensitive Wetlands, *Remote Sensing of Environment*, Under Review [Impact Factor: 11.1]
- Sahu, V., Raj, C., Swarnkar, S., and **Poonia, Vikas** (2025). From Episodic to Chronic: Progression of Compound Dry–Hot Extremes in Delhi, India, *Urban Climate*, Under Review [Impact Factor: 6.0]
- **Poonia, Vikas** and Goyal, M.K. (2025). Role of Blockchain Technology in Agri-food Sector: A Review of Applications, Challenges, and Future Guidelines, *Journal of Hydrologic Engineering*, Under Review [Impact Factor: 2.2]
- **Poonia, Vikas**, Goyal, M.K., Wang, L. (2025). Smart Cities Require Smart Solutions: A Synthesis of Technologies, Applications, Challenges, and Future Research Directions, *International Journal of Information Security*, Under Review [Impact Factor: 3.2]

#### PUBLICATIONS- Book Chapters

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- Raj, C., Sahu, V., Swarnkar, S., and **Poonia, Vikas**, and Sahu, V. (2024), “Evaluating Compound Dry and Hot Events in Bhopal: Past Trends and Insights from Future Climate Projections”, Chapter in *Blue Sky, Blue Water – Strategies for Protecting Air and Water Quality in the 21st Century*, Publisher: Taylor & Francis (Accepted)
- Panigrahi, M., Sharma, A., and **Poonia, Vikas**. (2024), “Advancements and Challenges in Flood Modeling: A Comprehensive Review of Empirical, Conceptual and Physically Based Approaches”, Chapter in *Geoinformatics for Flood Risk Management: Applications and Strategies*, Publisher: Taylor & Francis (Accepted)
- **Poonia, Vikas**, Wang, L., and Goyal M.K. (2023), “Copula-Based Probabilistic Evaluation of Meteorological Drought Characteristics over India”, Chapter 14 in *River, Sediment and Hydrological Extremes: Causes, Impacts and Management*, Publisher: Springer, Singapore. 10.1007/978-981-99-4811-6\_14
- **Poonia, Vikas**, Goyal M.K., Gupta A.K. and Gupta, A. (2022), “Drought as a disaster and its characterization over Central India”, Chapter 14 in *Hydro-Meteorological Extremes and Disasters: Integrated Risk, Remediation and Sustainability*, Publisher: Springer, Singapore. 10.1007/978-981-19-0725-8\_14
- Balvanshi, A., **Poonia, Vikas**, Tiwari, H.L., Goyal M.K., Gupta A.K. and Gupta, A. (2022), “Quantitative Assessment of Climate Change on Crop Evapotranspiration and Yield in Central Region of India”, Chapter 12 in *Hydro-Meteorological Extremes and Disasters: Integrated Risk, Remediation and Sustainability*, Publisher: Springer, Singapore. 10.1007/978-981-19-0725-8\_12
- Pandey, B.K., **Poonia, Vikas**, Khare, D., and Goyal M.K. (2022), “Understanding of Future Water Challenges in a River Basin Under Ensemble of CORDEX Simulated Projections”, Chapter 13 in *Hydro-Meteorological Extremes and Disasters: Integrated Risk, Remediation and Sustainability*, Publisher: Springer, Singapore. 10.1007/978-981-19-0725-8\_13
- **Poonia Vikas**, Goyal M.K.; Madramootoo C.A.; Gupta A.K.; Saraswat C. (2020), “Impact of COVID-19 on Agro-Food Industry and Transitions towards Food Security”, Chapter 12 in *Integrated Risk of Pandemic: Covid-19 Impacts, Resilience and Recommendations*, Publisher: Springer, Singapore. [https://doi.org/10.1007/978-981-15-7679-9\\_12](https://doi.org/10.1007/978-981-15-7679-9_12)

- Borana, L., Bhowmik, S., Panwar, V.K., Goyal M.K., and **Poonia, Vikas** (2021), "Madhya Pradesh", Chapter 21 in **Geotechnical Characteristics of Soils and Rocks of India**, Publisher: CRC Press.  
<https://doi.org/10.1201/9781003177159>

#### **TECHNICAL REPORTS**

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- Gupta, A. K., Goyal, M.K., **Poonia, Vikas**, Verma, K., Jain, V. and Rakkasagi, S. (2023). Mayor's Handbook: City Guide for Disaster Risk and Resilience: For Mayors and Municipal Administration. National Institute of Disaster Management, New Delhi.
- Goyal, M.K., **Poonia, Vikas**, Kumar, N., Jha S., Gupta, A.K. and Acharya, P. (2020). Agriculture Resilience Assessment Over Central India Under Climate Change. National Institute of Disaster Management, New Delhi, Pages 84.

#### **CONFERENCE/WORKSHOPS/POSTERS/SEMINARS**

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- Presented a paper at the **2<sup>nd</sup> International Conference cum Workshop on Urban Livability 2025: Navigating Climate Extremes in The Global South** organized by the Department of Architecture and Planning, MANIT Bhopal during 03-04 November 2025.
- Presented a paper at the **41<sup>st</sup> International Association for Hydro-Environment Engineering and Research (IAHR) World Congress** at Singapore EXPO, Singapore during 22-27<sup>th</sup> June 2025.
- Presented a paper at **40<sup>th</sup> MP Young Scientist Congress** organized by M.P. Council of Science and Technology, Government of India, 27-29 March, 2025 Ujjain, Madhya Pradesh, India.
- Presented a paper at the **International Perspectives in Water and Environment Conference (IPWE)** organized by the Environmental & Water Resources Institute of the American Society of Civil Engineers (ASCE-EWRI) in partnership with the Madhya Pradesh State Water Resources Department (MPWRD) at Bhopal during 8-10<sup>th</sup> January 2025.
- Presented a paper at HYDRO-2024, 29<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the **Central Water & Power Research Station (CWPRS)**, in association with the **Indian Society of Hydraulics (ISH)** held during 18-20<sup>th</sup> December 2024.
- Presented a poster at **8<sup>th</sup> India Water Week, 2024** organized by the **Ministry of Jal Shakti, Government of India** at the Bharat Mandapam in New Delhi during 17-21<sup>th</sup> September 2024.
- Presented a paper at the **International Water Conference for Sustainable Development Goals (IWCSDG-2024)**, organized by the Department of Civil Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal, Madhya Pradesh during March 22-23, 2024.
- Presented a paper at **39<sup>th</sup> MP Young Scientist Congress** organized by M.P. Council of Science and Technology, Government of India, 21-23 February, 2024 Gwalior, Madhya Pradesh, India.
- Presented two papers at HYDRO-2023, 28<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the Department of Civil Engineering, **National Institute of Technology, Warangal NITW**, in association with the **Indian Society of Hydraulics (ISH)** held during 21-23 December, 2023.
- Presented a paper at **AGU23, San Francisco, CA, USA** held during 11-15 December, 2023.
- Participated in the webinar on "**Heat Wave Risk Management**" on **31 May 2022** organized by the **National Institute of Disaster Management**, Ministry of Home Affairs, Govt. of India.
- Presented a paper at HYDRO-2021, 26<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the Department of Civil Engineering, **Sardar Vallabhbhai National Institute of Technology, Surat**, in association with the **Indian Society of Hydraulics (ISH)** held during 23-25 December, 2021.
- Presented a paper at International Conference on "**Ecosystem Restoration for Resilience and Sustainability: Living with Nature**" (World Environment Day-Launch of UN decade for Ecosystem Restoration), jointly organized by Indian Institute of Technology Indore and National Institute of Disaster Management, Delhi during 05-07 June, 2021.
- Presented a paper at HYDRO-2020, 25<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by Department of Civil Engineering, **National Institute of Technology Rourkela, India** in association with the **Indian Society of Hydraulics (ISH)** held during 26-28 March, 2021.
- Presented a paper at International Conference on "Water and Environment" (ICWE-2021), organized by Department of Civil Engineering, **Maulana Azad National Institute of Technology (MANIT)**, Bhopal, Madhya Pradesh during 10-12 December, 2021.

Pradesh during March 22-23, 2021

- Presented a paper at **36<sup>th</sup> MP Young Scientist Congress** organized by M.P. Council of Science and Technology, Government of India, 23-26 March, 2021 Ujjain, Madhya Pradesh, India.
- Presented a poster at **Innovations in Agriculture- Agricultural Scientists Meet: Sixth edition of India International Science Festival (IISF-2020-Virtual)** organized by the Ministry of Science & Technology, Ministry of Health & Family Welfare and Ministry of Earth Sciences in association with Vijnana Bharati (VIBHA) during 22-25 December, 2020.
- Presented a paper presentation at **IGU India International Conference (Virtual) 2020, on Global to Local Sustainability & Future Earth** organized by Department of Geography, Faculty of Earth Sciences, MLSU, Udaipur, India during 18-20 December, 2020.
- Attended three weeks online certificate program on **Hydrometeorological and Extreme Events Disaster Risk Management** jointly organized by Discipline of Civil Engineering, Indian Institute of Technology Indore and National Institute of Disaster Management, Delhi during 1-21 June, 2020.
- Presented a paper at **35<sup>th</sup> MP Young Scientist Congress** organized by M.P. Council of Science and Technology, Government of India, 28-29 February, 2020 Indore, Madhya Pradesh, India.
- Presented a paper at the International Conference on Recent Advances in Life Sciences for Betterment of Environment and Human Health, organized by Government Holkar Science College, Indore, Madhya Pradesh, India 14-15 December 2019.

#### **CONFERENCES BY SCHOLARS**

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- Presented three papers at the **2<sup>nd</sup> International Conference cum Workshop on Urban Livability 2025: Navigating Climate Extremes in The Global South** organized by the Department of Architecture and Planning, MANIT Bhopal during 03-04 November 2025.
- Presented two papers at the **5<sup>th</sup> International Forum on Asian Water Environment Technology (IFAWET-5), jointly organised by the University of Tokyo (Japan), UPES Dehradun (India), Indian Institute of Technology Roorkee (India), National Institute of Hydrology Roorkee (India), and Tecnológico de Monterrey (Mexico)** at Dehradun from August 06-08, 2025.
- Presented a paper at the **1<sup>st</sup> International Conference on Advances in Water Resources**, organized by the Department of Civil Engineering and the Centre of Excellence in Water Management at Maulana Azad National Institute of Technology, Bhopal, India, in association with Central Water Commission, Ministry of Jal Shakthi, Govt of India during 10-12 June 2025.
- International Perspectives in Water and Environment Conference (IPWE)** organized by the Environmental & Water Resources Institute of the American Society of Civil Engineers (ASCE-EWRI) in partnership with the Madhya Pradesh State Water Resources Department (MPWRD) at Bhopal during 8-10<sup>th</sup> January 2025.
- Presented two papers at the **International Perspectives in Water and Environment Conference (IPWE)** organized by the Environmental & Water Resources Institute of the American Society of Civil Engineers (ASCE-EWRI) in partnership with the Madhya Pradesh State Water Resources Department (MPWRD) at Bhopal during 8-10<sup>th</sup> January 2025.
- Presented two papers at HYDRO-2024, 29<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the **Central Water & Power Research Station (CWPRS), in association with the Indian Society of Hydraulics (ISH)** held during 18-20<sup>th</sup> December 2024.
- Presented two papers at **AGU24, Washington, D.C, USA** held during 9-13 December 2024.
- Presented a poster at **H<sub>2</sub>O and Climate Conference** organized by Indian Institute of Technology (IIT) Kanpur on 27-28 October 2024.

#### **TEACHING AND RELATED ACTIVITIES**

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- Teaching Fluid Mechanics, Global Warming & Climate Change (UG Level), MANIT Bhopal
- Teaching Applied Hydrology and Research Methodology (PG Level), MANIT Bhopal
- Teaching Surveying (UG Level), NIT Calicut

#### **PROJECTS/GRANTS**

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- Project title** – " From Snowpack to Soil: Understanding Compound Drought Linkages and Summer Water Scarcity in India's Indus Water Treaty Western Basins " (3 Years) Sanctioned by - Anusandhan National Research Foundation (**ANRF**) India under Advanced Research Grant (ARG); Project Value – 82 Lakhs INR; Date

of Completion – 2029 [Ongoing], **[Role- Co-PI]**

- **Project title** – "Assessing Flash Drought Hotspots and Cascading Impacts on Indian Agriculture in a Changing and Warming Climate: An Integrated Approach for Early Warning Signs and Resilience" (3 Years) Sanctioned by - Anusandhan National Research Foundation (**ANRF**) India under Prime Minister Early Career Research Grant; Project Value – 29.04 Lakhs INR; Date of Completion – 2028 [Ongoing], **[Role- PI]**
- **Project Title**- "Geo-Social Synergies for Drought Adaptation: Integrating Geospatial Technologies, Social Vulnerability, and Cultural Strategies in the Marathwada region, Maharashtra" (3 Years) Sanctioned by - Indian Council of Social Science Research (**ICSSR**) under 2<sup>nd</sup> Call for ICSSR Longitudinal Studies in Social and Human Sciences; Project Value – 30 Lakhs INR; Date of Completion – 2028 [Ongoing], **[Role- Co-PI]**
- **Project title** – "A novel approach to evaluate the occurrence and mechanisms of flash drought and its impacts on crop yield over Indiana " (1 Year) Sanctioned by -Indiana Water Resources Research Center (IWRRC) through the United States Geological Survey; Project Value – 20.50 Lakhs INR; [Completed], **[Role- Co-PI]**
- **REFRESHER Course** on- "Climate Change, Hydro-Meteorological Extremes and Emerging Solutions" (2 Week during July 17- July 29, 2025) Sanctioned by UGC-Malaviya Mission Teacher Training Centre, **Total Grant – 2.4 Lakhs INR**; [Role – **Course Instructor**]
- **AICTE-QIP-PG Certificate Programme** for the academic session 2025-26 on "Hydrometeorological Extremes and Climate Disasters: Data-Driven Approaches, Impacts and Resilient Strategies" (6 months) sanctioned by All India Council for Technical Education (AICTE) under AICTE-QIP-PG scheme, **Total Grant- 14 Lakhs INR**; **[Role-Program Coordinator]**
- **GIAN Course** on- "Climate Change and Compound Hydro-Meteorological Events: Insights from Data and Modeling" (1 Week during 19-23 may 2025) Sanctioned by Ministry of Education under 'Global Initiative of Academic Networks (GIAN)' Scheme, **Total Grant – 6.64 Lakhs INR**; [Role – **Host Faculty** and Course Coordinator]
- One Week Short Term Training Program on- "Hydrological Modeling Using Soil & Water Assessment Tool (SWAT)" (1 Week during 05-09 May 2025) Sponsored by **Anusandhan National Research Foundation (ANRF)** under 'Financial Assistance to Professional Bodies and Seminar/Symposia' Scheme, Total Grant- 1.8 Lakhs INR; **[Role-Course Coordinator]**

#### **Self Sponsored STTP/Workshop**

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- **Coordinator** of a one-week short-term training program on Extreme Hydrometeorological Events in a Changing Climate and Application of RS and GIS jointly organized by the Centre of Excellence in Water Management and the Department of Civil Engineering, Maulana Azad National Institute of Technology Bhopal, during **08-12 July 2024**.
- **Coordinator** of a one-week short-term training program on Hydro-Climatic Extremes, Hydraulics and Groundwater Modelling organized by the Centre of Excellence in Water Management, Maulana Azad National Institute of Technology, Bhopal, during **10-14 June 2024**.

#### **VOLUNTEERING EVENTS/SESSION CHAIRS**

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- Chair a session at the **2<sup>nd</sup> International Conference cum Workshop on Urban Livability 2025: Navigating Climate Extremes in The Global South** organized by the Department of Architecture and Planning, MANIT Bhopal during 03-04 November 2025.
- External examiner for the conduction of Ph. D Pre-Defense Viva Voce at Madhyanchal Professional University, Bhopal on 01 August 2025.
- Subject Expert for the RDC of PhD Scholars at LNCT University Bhopal on 21 July 2025.
- Chair a session at the **International Conference on Advances in Science and Engineering** held at Madhyanchal Professional University, Bhopal, from April 28–30, 2025.
- Reviewer for the **Health Hackathon 2025** titled "Improving Health Through Accessible and Empowering Innovation", jointly organized by VIT Bhopal University, India, and Johns Hopkins University (JHU), Baltimore, USA, during 18-19<sup>th</sup> February 2025.
- Moderator a session at the **International Perspectives in Water and Environment Conference (IPWE)** organized by the Environmental & Water Resources Institute of the American Society of Civil Engineers (ASCE-EWRI) in partnership with the Madhya Pradesh State Water Resources Department (MPWRD) at Bhopal during 8-10<sup>th</sup> January 2025.
- Chair a session at HYDRO-2024, 29<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the **Central Water & Power Research Station (CWPRS)**, in association with the

**Indian Society of Hydraulics (ISH)** held during 18-20<sup>th</sup> December 2024.

- **Chair a session** at International Water Conference for Sustainable Development Goals (IWCSGD-2024), organized by Department of Civil Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal, Madhya Pradesh during March 22-23, 2024.
- Chair a session at HYDRO-2023, 28<sup>th</sup> International Conference on **Hydraulics, Water Resources and Coastal Engineering**, organized by the Department of Civil Engineering, **National Institute of Technology, Warangal NITW**, held during 21-23 December, 2023.
- **Chair two sessions** at **AGU23**, organized on 11-15 December, 2023 at the Moscone Center in San Francisco, CA, USA.
- Peer reviewer of **various journals**

#### **EXPERT LECTURES**

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- **Delivered two Expert Lectures** in the one-week **Faculty Development Programme** on "Climate Change—Floods and Droughts: Science, Impacts, and AI/ML Approaches", organized by the MHRD-MMTTC at the Centre for Science and Society (CS<sup>2</sup>), IISER Bhopal during 22-27 September 2025.
- **Delivered two Expert Lectures** at Sri Satya Sai University of Technology and Medical Sciences (SSSUTMS), Sehore (M.P.) as part of the **One Week ATAL Faculty Development Program (FDP)** organized by the School of Design during 15th-20th September 2025.
- Keynote speaker at the **5th International Forum on Asian Water Environment Technology (IFAWET-5)**, jointly organised by the University of Tokyo (Japan), UPES Dehradun (India), Indian Institute of Technology Roorkee (India), National Institute of Hydrology Roorkee (India), and Tecnológico de Monterrey (Mexico) at Dehradun from August 06-08, 2025.
- Keynote speaker at the **International Conference on Advances in Science and Engineering** held at Madhyanchal Professional University, Bhopal, from April 28–30, 2025.
- Delivered expert lecture on "**Climate Change and its impact on different sectors of the economy**," organized by the Department of Civil Engineering, Madhyanchal Professional University (MPU), Bhopal on 08<sup>th</sup> April 2025.
- Delivered **two expert lectures and a Hands-on training** session at the **CSIR-HRDG-sponsored one-week Workshop** on "Hydrological Modelling in Climate Change Scenario" organized by the Department of Civil Engineering, Shri Guru Gobind Singhji Institute of Engineering and Technology (SGGS), Nanded, Maharashtra on 18<sup>th</sup> March 2025.
- Delivered expert lecture at **Ministry of Electronics and Information Technology (MeitY), GoI Sponsored 12-Day Oline Faculty Development Program (FDP)** on "Applications of MATLAB in Civil Engineering" on "Flash drought modeling across Indian river basins using an Innovative approach" organized by the Electronics & ICT Academy, NIT Warangal, in collaboration with the Department of Civil Engineering, SRGEC, Gudlavalleru, India during 17-28 February 2025.
- Delivered expert lecture at the Online Faculty Development Program (FDP) on "Application of Computational Intelligence in Civil Engineering", organized by the MANUU Polytechnic, Maulana Azad National Urdu University, Hyderabad from 17th February to 28th February 2025.
- Delivered expert lecture on "**Advanced Methodology for Intensified Flash Drought Detection and its Impact on Terrestrial Ecosystem across Indian River Basins**," organized by the Department of Geophysics, Kurukshetra University, Kurukshetra, Haryana on 20<sup>th</sup> February 2025.
- Delivered an expert lecture on Day-1 at **two-days online NPTEL short workshop** on "Google Earth Engine for Hydrological Applications: A Hands-on Introduction" on "Different Rainfall Datasets Available on the Google Earth Engine Platform" organized by the Department of Earth and Environmental Sciences, IISER Bhopal during 11-12<sup>th</sup> January 2025.
- Delivered an expert lecture on Day-2 at **two-days online NPTEL short workshop** on "Google Earth Engine for Hydrological Applications: A Hands-on Introduction" on "Introduction to Watershed Analysis and Hydrological Applications Using DEMs" organized by the Department of Earth and Environmental Sciences, IISER Bhopal during 11-12<sup>th</sup> January 2025.
- Delivered expert lecture at **AICTE ATAL Sponsored 6-Day Online Faculty Development Program (FDP)** on "Disaster Risk Reduction through Sustainable Infrastructure" on "Novel Methodology for detecting flash drought disasters and assessing ecosystem impacts and resilience in India" organized by the Department of Civil Engineering, Ramachandra College of Engineering, Eluru, Andhra Pradesh during 16-21 December 2024.
- Delivered expert lecture at **Global Initiative of Academic Networks (GIAN), sponsored by the Ministry of Education, Government of India** on "Climate Change and Urbanisation" on "Advanced Methodology for Intensified Flash Drought Detection and its Impact on Terrestrial Ecosystems across Indian River Basins" jointly

organized by the Department of Architecture and Department of Civil Engineering, Maulana Azad National Institute of Technology Bhopal during 09-13 December 2024.

- Delivered expert lecture on “**Climate change and its impact over Indian cities**” and Judge in Brain of BGI Contest organized by the Department of Civil Engineering, Bansal Institute of Research & Technology and Bansal Institute of Research Technology & Science, Bhopal on 06<sup>th</sup> December 2024.
- Delivered expert lecture at **Capacity Development Program** “Forest Hydrology in the Changing Climate: Planning, Practice, and Policy Viewpoints” on “Advanced Methodology for Intensified Flash Drought Detection and its Impact on Terrestrial Ecosystem across Indian River Basins” organized by the Faculty, Ecosystem, and Environment Management, **Indian Institute of Forest Management (IIFM) Bhopal** during 22-22<sup>th</sup> November 2024.
- Delivered expert lecture on “**Climatic Extremes under the Changing Climate over India**” organized by the School of Earth and Environmental Science, Gangadhar Meher University, Odisha on 28<sup>th</sup> October 2024.
- Delivered an Expert lecture on **World Environment Day** on the theme “Land Restoration, Desertification and Drought Resilience” theme, organized by Madhya Pradesh State Centre, The Institute of Engineers, Habibganj, Bhopal on 5<sup>th</sup> June, 2024.
- Keynote speaker at **International Water Conference for Sustainable Development Goals (IWCSDG-2024)**, organized by the Department of Civil Engineering, Maulana Azad National Institute of Technology (MANIT), Bhopal, Madhya Pradesh during March 22-23, 2024.
- Presented an **expert lecture in a seminar** on “Terrestrial ecosystem response to flash droughts across Indian river basins” organized by the **Department of Earth Sciences, Indiana University-Purdue University Indianapolis (IUPUI), Indianapolis, USA** on 03<sup>rd</sup> March 2023.
- Presented an **expert lecture in a webinar** on “Flash Drought: Understanding Risk and Developing resilience” organized by the **National Institute of Disaster Management, Ministry of Home Affairs, Government of India** on 28<sup>th</sup> July 2022.
- Presented an **expert lecture in a webinar** on “Impact of Climate Change on Crop Productivity and Crop Water Requirements” organized by **BRCM College of Engineering and Technology, Bahal, Bhiwani (Haryana)** on 15<sup>th</sup> February 2022.
- Presented an **expert lecture in a webinar** on “Sustainable water resources management in the Himalayan region” organized by **Indian Institute of Technology Jammu (J&K)** on 29<sup>th</sup> December 2021.
- Presented a **course expert lecture** on “Regional Crop Water & Irrigation Requirements for Different Major Crops in Sikkim Under Changing Climate Scenarios” jointly organized by IIT Indore and National Institute of Disaster Management, Delhi, 01-21 June 2020.