Dr. SUBBARAO PICHUKA

Assistant Professor, Department of Civil Engineering
Indian Institute of Technology (IIT), Madras,
Chennai – 600036, Tamilnadu, India

Reach out to me at

DoB: 10-06-1989

Research Interests

- Hydrological Extremes
- Climate Change Impacts on Water Resources
- Integrated Water Resources Management
- Urban Hydrology
- Dam Safety Under the Changing Climate

Educational Qualification

Ph. D (2019) – Indian Institute of Technology (IIT) Kharagpur, West Bengal

M.Tech (Water Resources Engineering and Management, 2012) – IIT Guwahati, Assam

B-Tech (Civil Engineering, 2010) – Bapatla Engineering College, Andhra Pradesh

Publications

1. **Pichuka, S**., & Maity, R. (2016). Spatio-temporal downscaling of projected precipitation in the 21st century: indication of a wetter monsoon over the Upper Mahanadi Basin, India. Hydrological Sciences Journal, 62(3), 467–482. doi:10.1080/02626667.2016.1241882.
2. **Pichuka, S**., Rajendra Prasad, R., Maity, R., & Kunstmann, H. (2017). Development of a method to identify change in the pattern of extreme streamflow events in future climate: Application on the Bhadra reservoir inflow in India. Journal of Hydrology: Regional Studies, 9, 236–246. doi:10.1016/j.ejrh.2016.12.084.
3. **Pichuka, S**., & Maity, R. (2018). Development of a time-varying downscaling model considering non-stationarity using Bayesian approach. International Journal of Climatology, 38 (7) 3157-3176, doi:10.1002/joc.5491.
4. **Pichuka S**., & Maity R (2020) Assessment of Extreme Precipitation in Future through Time-Invariant and Time-Varying Downscaling Approaches. Water Resources Management, 34:1809–1826. Doi: 10.1007/s11269-020-02531-6.
5. **Pichuka S**., & Maity R (2020) How far the CORDEX high-resolution data represents observed precipitation for the Indian region: an analysis across Indian mainland Theoretical and Applied Climatology, 142: 892-910. doi.org/10.1007/s00704-020-03355-5.
6. **Pichuka S**., Maity SS & Maity R (2021) Benefit of Time-Varying Downscaling Model (TVDM) for the Assessment of Urban Temperature Rise. Modelling Earth Systems and Environment. 8: 2431-2447.DoI: https://doi.org/10.1007/s40808-021-01239-9.
7. Roulo D & **Pichuka S** (2023). "A review study on Indian Dam Failures", Central Board of Irrigation and Power, Water and Energy International.
8. Arjuman RR., **Pichuka S** & Tripathi A (2024) "Applications of Sentinel-5P TROPOMI Satellite Sensor: A Review," in IEEE Sensors Journal, doi: 10.1109/JSEN.2024.3355714.

9. **Pichuka S** & Roulo D (2024) Dams and their safety under the extreme climate conditions: study of dams on Godavari River, Sustain. Water Resour. Manag. 10, 32, Doi: https://doi.org/10.1007/s40899-023-01018-7.
10. Karmakar J, Mondal I, Hossain SA, Jose FC, **Pichuka S**, Ghosh D, De TK, Lu Q-O, Elkhrachy I & Nguyen N-M (2024) "Analyzing spatio-temporal variability of aquatic productive components in Northern Bay of Bengal using advanced machine learning models" Ocean & Coastal Management", Volume 251, 107074. https://doi.org/10.1016/j.ocecoaman.2024.107074.
11. Roulo D & **Pichuka S** (2024). "Assessing the effects of extreme rainfall patterns and their impact on dam safety: a case study on Indian dam failures", Natural Hazards. Doi: 10.1007/s11069-024-06720-z.

Research & Consultancy Projects

1. How will Godavari basin respond in terms of rainfall distribution and streamflow variation owing to climate change? Sponsor – DST, SERB, GoI 20/12/2020 - 21-06-2023, amount (in INR) - ₹19,98,990/- [Completed] – Role: Principal Investigator (PI).
2. Assessment of change in rainfall patterns over the Godavari River Basin (GRB) in the context of climate change, Sponsor - NIT Andhra Pradesh, 05/11/2020 - 14/02/2023, amount (in INR) - ₹4.30 lakhs [Completed] – Role: PI.
3. Hydrological extremes in a changing climate, Sponsor - IIT Madras, Budget (in INR) – 5 lakhs [Completed] – Role: PI.
4. Advances in Geospatial Technologies, Sponsor - Department of Science and Technology, GoI., Budget – 10.2 lakhs [Completed] – Role: PI.
5. Water Circularity and Infrastructure in Towns and Cities Under Climate Extremes, Sponsor - Kings College London, UK and IIT Madras, India, Budget (in INR) - 10.6 lakhs [Completed] – Role: PI.
6. Flood & Earthquake Safety of Existing Dams in State of Maharashtra, Sponsor – WRD Maharashtra, India, Budget (in INR) - 248 lakhs [Ongoing] – Role: Co-PI.
7. 'Sluice Seepage Assessment of Thimmaraju and Paleru Earth Dam, Owk Reservoir Complex, Nandyal District, Andhra Pradesh', Sponsor – WRD Andhrapradesh, India, Budget (in INR) - 04 lakhs [Ongoing] – Role: PI.
8. Integrated Flood Management Study in the Sathanur Dam, Sponsor – WRD Tamilnadu, India, Budget (in INR) - 16 lakhs [Under Review] – Role: PI.

Book Chapters

1. **Pichuka S** and Maity R (2021), Time-Varying Downscaling Model (TVDM) and its Benefit to Capture Extreme Rainfall. ISBN 978-3-030-64202-0.

2. Subbarao T and **Pichuka S** (2021), Computational Models for Exchange of Water between Ground Water and Surface Water Resources over a Sub-basin, CRC Press, Taylor&Francis. Accepted.

3. **Pichuka S**, Srikanth B and Nandikanti SSS (2023), Application of TVDM in Modeling the Observed Precipitation Over Godavari River Basin, India, Springer, ISBN 978-981-19-8524-9. https://doi.org/10.1007/978-981-19-8524-9.

4. **Pichuka S** and Nandikanti SSS (2023), Modelling of Streamflow Considering the Effects of Land Use Land Cover Change Over the Sabari River Basin, India. Springer, ISBN 978-981-99-4422-4.

Conferences (International and National)

1. **Pichuka S** and Maity R (2015), Development of a Time Varying Downscaling Model Using Bayesian Approach and its Comparison with Statistical Downscaling Model, In the Proceedings of the 20th

International Conference on Hydraulics, Water Resources and River Engineering (HYDRO-2015), December 17-19, 2015, IIT Roorkee, Uttarakhand, India.

2. **Pichuka S** and Maity R (2016), Impact of Climate Change on Monthly Precipitation during 21st Century in Upper Mahanadi Basin, India, In the Proceedings of 3rd National Conference on Sustainable Water Resources Development and Management (SWARDAM-2016), July 4-5, 2016, Government College of Engineering, Aurangabad - 431005, Maharashtra, India.
3. **Pichuka S** and Maity R (2018), Time-Invariant and Time-Varying Downscaling Approaches for the Assessment of Extreme Temperature Rise during 21st Century. Abstract is published in the proceedings of EGU-2018 session HS2.4.1, abstract EGU2018-11645, April 8-13, held at Vienna, Austria.
4. Pichuka S and Maity R (2018), Assessment of Extremes using Time-Varying Downscaling Model. In the Proceedings of the 23rd International Conference on Hydraulics, Water Resources and River Engineering (HYDRO-2018), December 19-21, NIT Patna, Bihar, India.
5. Pichuka S and Maity R (2018), Downscaling of Soil Moisture using Time-Varying Downscaling Model. Published in the American Geophysical Union (AGU) Fall meeting-2018, December 10-14, Washington DC, USA.
6. **Pichuka S** and Maity R (2019), Assessment of urban temperature rise using Time-Varying Downscaling Model. Published in the proceedings of National Environmental Conference 2019, January 31 – February 02, IIT Bombay, India.
7. **Pichuka S**, Srikanth B and Syam NSS (2022), Efficacy of TVDM in downscaling the observed precipitation over the Godavari River Basin, India. In the Proceedings of the 26th International Conference on Hydraulics, Water Resources and Coastal Engineering (HYDRO-2021), December 23-25, SVNIT Surat, Gujarat, India.
8. **Pichuka S** and Syam NSS (2022), Modelling of Streamflow Considering the Effects of Land Use Land Cover Change over the Sabari River Basin, India. In the Proceedings of the 2nd International Conference on River Corridor and Research Management (RCRM), May 30- June 1, 2022, IIT Guwahati, India.
9. Rathna Kumar V and **Pichuka S** (2022), Assessment of rainfall trends and variability over the Sabari River basin, India. In the Proceedings of the 27th International Conference on Hydraulics, Water Resources, Environmental and Coastal Engineering (HYDRO-2022), December 22-24, Punjab Engg. College, Chandigarh, India.
10. R Dinesh and P Subbarao, (2022). A Review Study on Indian Dam Failures, International Dam Safety Conference 10-12 Oct 2022, Jaipur, India.
11. Dinesh,R., and Pichuka,S., (2024), "Trends and Variability of Future PMP and PMF considering Climate Change: A Study on Dams of Godavari River Basin," ICOLD 2024 Symposium, 29 Sep - 03 Oct 2024, New Delhi, India.

12. **Pichuka S** and Dinesh R (2025), Extreme Rainfall vs Dam Safety: A Study on Dam Failures in India. EGU25-16556, https://doi.org/10.5194/egusphere-egu25-16556, EGU General Assembly 2025, Vienna, Austria.

Employment Experience

- **Assistant Professor (Feb 2023 – Continuing):** Department of Civil Engineering, IIT Madras
- **Assistant Professor (Oct 2019 – Feb 2023)**: Department of Civil Engineering, NIT Andhra Pradesh
- **Lecturer (Jul** 2013 – Dec 2014): Department of Civil Engineering, RGUKT, IIIT Basar.

Awards

- Awarded Ministry of Human Resources Development (MHRD), Govt. of India scholarship during M.Tech tenure (2010-2012).
- Awarded MHRD scholarship for research program from January 2014 to January 2019.
- Awarded full funding by IIT Kharagpur for traveling to Roorkee to present a research paper at the 20th International Conference on Hydraulics, Water Resources and River Engineering (HYDRO-2015) held at IIT Roorkee, Roorkee, India, December 2015.
- Awarded full funding (travel and accommodation) by IIT Kharagpur for traveling to Vienna, Austria to present a research poster at the EGU2018 held at Vienna Centre, Austria, April 2018.
- Awarded full funding (travel and accommodation) by IIT Kharagpur for traveling to Washington DC, USA to present a research poster at the AGU2018 fall meeting held in Washington DC, USA, December 2018.
- Awarded International Travel Support (ITS) travel funding from the Department of Science and Technology (DST) Govt. of India for traveling to Washington DC, USA to present a research article at the AGU2018 fall meeting held at Washington DC, USA, December 2018.
- Awarded as 'Young Researcher' by Venus International Foundation in 2021.