CURRICULUM VITAE

Name: **NARENDRA KUMAR GOEL**

Designation: Professor, Department of Hydrology,
Head, International Centre of Excellence for Dams
Indian Institute of Technology Roorkee,
Roorkee- 247667, India

Date of Birth: April 24, 1959

Contact Details: nkgoel@hy.iitr.ac.in; head@iced.iitr.ac.in; coordinator.dsr@iitr.ac.in; goelhy@gmail.com
Mob. +91-9412393851; Tel. +91-1332-285654 (ICED); Tel. +91-1332-285814 (Hydrology)

Education: **B. Tech.** (Civil Engineering), 1980, GBPUA&T, Pantnagar.
M. Tech. (Water Resources Engineering), 1982, IIT Delhi.
Certificate of Hydrology, 1984, CSU, USA.
Ph.D. (Hydrology), 1991, IIT Roorkee.
Post-Doctoral collaborative work at Uni. of Waterloo, Canada with Prof. Donald H. Burn and Tufts Uni. USA with Prof. Richard M. Vogel.

Specialized Training Abroad:

- August 1983- Jan. 1984 at CSU, USA in Stochastic Hydrology under the guidance of Prof. Warren Hall and Prof. J.D. Salas.
- Nov. –Dec. 1987 at University College Galway, Ireland in Flood Forecasting under the guidance of Prof. J.E. Nash.

Professional Experience:

National Institute of Hydrology, Roorkee: May 1982 – June 1988, as Scientist B and C.
Indian Institute of Technology Roorkee: June 1988 onwards; Reader, Associate Professor, Professor and Professor (HAG)
Area of Specialization: Stochastic Hydrology, Extreme value estimation, Flood estimation and forecasting, Power generation projects and pipeline projects, hydrological analysis and planning, Dam Engineering.

Awards:

- **Ravi Mohan Mangal Institute Chair Professor of IIT Roorkee, 2023- Contd.**
- **Adjunct Professor, IIT Mandi**
- **Outstanding Alumnus of College of Technology, GBPUAT, 2019**
- **Chair Professor, Bharat Singh Chair for Water Resources** (MoJS, DoWR, GR&RD); 2013-2017
- **ASCE-EWRI -2014** Best Case Study award
- **'Adjunct Professor' University of Waterloo, Canada** 2003-2006.
- **Khosla Research Prize** in the years 1999, 2001 and 2002.
- '**Star performer status'** for six times in a row by IIT Roorkee since 2001.

Membership of National & International Committees:

- Member, Sub-committee of National Committee on Dam Safety (NCDS) on Capacity Development (2023- onwards)
- Member, Society of National Institute of Hydrology, MoJS, Government of India (2021- Onwards)
- Member Sub-committee for Comprehensive Evaluation and System Studies on Interlinking of Rivers, Ministry of Jal Shakti, GoI (2022- onwards)
- Member, Dam Safety Review Panel of NEEPCO (2022 onwards)
- Member sub-Committee for Comprehensive Evaluation and System studies on Interlinking of Rivers (September 2022 onwards)
- Member, Dam safety review panel of the Government of Chhattisgarh (2019 onwards)
- Member, Panel of experts, UPSC.
- Editor, Journal of Hydrology, Indian Association of Hydrologists 2003-07.
- Member, Expert Committee, Evaluation of mining projects, MoEF, GoI. (2006-08).
- Member, TAC, National Institute of Hydrology, MoWR, RD &GR, GoI (2009-11).
- Member, Indian National Committee on Hydrology, MoWR, RD &GR, GoI (2009-11).
- Member, Sub-committee on WRD, Bureau of Indian Standards, GoI (2012- Cont.).
- Member, State Expert Appraisal Committee, Uttarakhand, MoEF, GoI, (2013-2017).
- Member, Indian National Committee of IHP, GoI (2013- Contd.).
- Member, Committee for International Commission on Large Dams, India (2014 –contd.).
- Member, multi-disciplinary committee, MoWR, RD &GR, GoI on 'Reduction of flow in Pamba and Periyar rivers 2014- onwards
- Member, working group on 'Design flood estimation', Central Water Commission, MoWR, RD &GR, GoI (2014- onwards)

Membership of Professional Societies

- Member, International Water Association,
- Member, International Association of Hydrological Sciences,
- Member, Indian Association of Hydrologists,
- Member, Indian Water Resources Societies,
- Member, Wind society,
- Member, Indian Association of Soil and Water Conservationists
- Member, Indian National Committee on Large Dams.

Technical Accomplishments:

- Guided **21 Ph.D. Dissertations** (including 5 in progress)
- Guided **77 M. Tech. Dissertations** (including 2 in progress)
- Published **2 books** (Edited proceedings of international conferences)
- Published **60+ technical papers** in refereed national and International Journals
- Published **70+ technical papers** in National and International seminar proceedings.
- Published **15 Technical reports.**
- Participated in **50+ consultancy projects** (over 30 as Principal Investigator) with a total financial outlay of over Rs. 400 million
- Participated in **9 research projects** (6 as PI and 3 as co-PI) worth INR 1.300 Billion.

- Organized 60+ **sponsored short-term courses** for the officers of various organizations, including 10 International programmes.

Courses handled at the post-graduate level:

- Stochastic Hydrology
- Deterministic Hydrology
- Physical Hydrology
- Flood forecasting
- Hydrological Safety Evaluation of Dams
- Dam Safety surveillance, instrumentation, and monitoring
- Hydrologic elements and analysis
- Engineering Hydrology
- Urban Hydrology
- Natural hazard and impact assessment
- Hazard monitoring, prediction, and micro-zonation.

Administrative Responsibilities:

(i) Head, International Central Excellence for Dams (ICED) at IIT Roorkee (2023 onwards)

- Establishment of the International Centre of Excellence for Dams at IIT Roorkee under DRIP phase II and III with a grant of Rs 108.99 Crores.

(ii) Coordinator, Dam Safety and Rehabilitation Programme at IIT Roorkee (2017 -2022)

- Organized National Dam Safety Conference in coordination with UJVNL and Central Water Commission on February 18-19, 2017.
- Executed a project worth Rs. 10.92 Crores on Capacity building in Dam Safety and Rehabilitation
- Started an M Tech Programme on Dam Safety and Rehabilitation, which is jointly being conducted by the Departments of Hydrology, Earthquake Engineering, Civil Engineering and WRDM

(iii) Chairman, Hospital Advisory Committee (2012 – 2016)

- Interaction with every section of the IIT community
- Facilitating medical services to about 15000 members of IITR Community through a team of about 60 medical and paramedical staff
- Got the auditing of Institute hospital done through independent agency HOSMAC for better resource management
- Got CGHS based MATR-2012 implemented, which was pending since last 10 years
- Carried out MoU's with local hospitals as well as super –specialty hospitals like Max, Fortis, Apollo, Metro etc.
- Initiated selection process for recruitment of doctors based on DACP scales.

(iv) Dean of Students' Welfare (2009-2011)

- Led a team of about over 80 faculty members to look after the Welfare (Bhawan i.e hostel, Mess and extra-curricular activities) of about 7000 students
- Execution and operation of 4 new students' hostels for 2500 students
- Conceptualization, planning and execution of "Multi-activity Centre' for students
- Conceptualization and planning of 'Students Live Centre cum sports complex'
- Strengthening of sports facilities and setting up of SDS labs in hobbies club

- Initiated a number Students welfare schemes like creation of Students' Counselling Cell, 'Earn while you learn' scheme for poor students, Child care centre, Counseling of academically poor students at Hostel and Department levels etc.

(v) Head, Department of Hydrology (2006-2008)

- Led a team of 10 faculty members.
- Got the Department re-empaneled operational under ITEC and SCAPP programs of MoEA, GoI
- Initiated actions for recognition of the Department as Regional Training Centre of WMO
- Initiated collaboration with UNESCO-IHE Delft and coordinated PoWER project with 15 partner countries from IIT R side.
- Initiated collaboration with several field organizations likes NTPC Ltd., NHPC Ltd., THDC India, SJVN Ltd., DVC, State Govt. departments
- Initiated 'Purpose driven studies' with Govt. of Himachal Pradesh & Govt. of Orissa.
- Enhanced Institute -Industry interaction resulting in award of about 30 consultancy projects (more than Rs 4 crores).

(vi) Chief Advisor Sports (2004-2005)

- Led a team of 15 faculty advisors and 3 sports officers
- Conceptualized, planned, and executed the infrastructure development for sports facilities worth Rs. 2.5 crores at IIT, Roorkee in a record time of about one year.
- Coordinated first ever inter IIT sports meet at IIT Roorkee. In this meet about 1200 students from 7 IITs participated
- IIT Roorkee ranked second amongst 7 IIT's.

(vii) Coordination and MoU's handled

- Coordinator, International Centre of Excellence for Dams at IIT Roorkee under DRIP phase II and III with a grant of Rs 108.99 Crores.
- MoA for the establishment of the International Centre of Excellence for Dams at IIT Roorkee under DRIP phase II and III with a grant of Rs 108.99 Crores.
- Coordinator, M Tech programme on Dam Safety and rehabilitation and DRIP project at IIT Roorkee.
- MoU between IIT Roorkee and National Institute of Hydrology
- Coordination with World Meteorological Organization, Geneva
- MoU between IIT Roorkee and UNESCO-IHE Delft and PoWER members of about 15 countries
- MoU between IIT Roorkee and University of Waterloo, Canada

DISTINGUISHED PERSONS WELL ACQUAINTED WITH MY WORK

(i) Prof. K. K. Pant,
Director, Indian Institute of Technology Roorkee
director@iitr.ac.in

(ii) Dr. Donald H. Burn,
Professor Emeritus and Adjunct Professor,
Dept. of Civil & Environmental Engineering, University of Waterloo,
200 University Avenue West, Waterloo ON N2L 3G1 CANADA
Phone: 001- 519 888-4567 Ext 33338 FAX:001- (519) 888-4349
dhburn@uwaterloo.ca; donburn369@gmail.com

(iii) Dr. Richard M. Vogel,
Research Professor and Professor Emeritus
Department of Civil and Environmental Engineering
Tufts University Medford, MA 02155,
Tel: 001- 617-627-4260 Richard.vogel@tufts.edu

(iv) Professor Vijay P. Singh,
Department of Biological and Agricultural Engineering
Texas A&M University; 321 Scoates Hall, 2117 TAMU
College Station, Texas 77843-2117, U.S.A.
Office: (979)-845-7028
Fax: (979)-862-3442
E-mail: vijay.singh@ag.tamu.edu
https://baen.tamu.edu/people/singh-vijay/
https://vijaypsinghtamu.wixsite.com/vsingh

(v) Prof. A.K. Chaturvedi, Former Director- IIT Roorkee,
Department of Electrical Engineering, IIT Kanpur
akc@iitk.ac.in, 0512-259-7613

(vi) Dr. S. C. Saxena, Former Director, IIT Roorkee,
Presently Pro Chancellor, Jaypee Institute of information Technology
A-10, Sector-62; Noida -201307
saxenasuresh@yahoo.co.in; saxenasuresh22@gmail.com
+91-7838189999

Annexure I

DETAILS OF PUBLICATIONS AND PROJECTS

Ph.D. THESES GUIDED:

1. Development of flow forecasting system for Glacier dominated basin by Tapas Nahak, Jointly with Dr Ajanta Goswami (2022; in progress)
2. Urban Flood Modelling by Tuhin Mukherjee, Jointly with Dr D S Arya (2021; in progress)
3. Multivariate nonstationary flood frequency analysis, Ankush (2020; in progress)
4. Short and medium range forecast of rainfall using ensemble models by Suman Gurjar, Jointly with Dr M K Goel (2020; in progress)
5. Flood estimation and forecasting by Bhanu Sharma (in progress)
6. Study of flood Scenario of Jhelum Basin with regard to Catchment area and climate change by Sheikh Umar under joint guidance of Dr M A Lone at NIT Srinagar (defended on June 28, 2022)
7. Climate extreme studies in changing climate over India by Bratati Chowdhary, jointly with Dr Manohar Arora (Awarded, 2021)
8. Development of an operational flood forecasting system for Tehri dam by Niraj Kumar Agrawal jointly with Dr A K Lohani (Awarded, 2019)
9. Climate Variability Studies over parts of India with focus on Hydro-climatic variables by Litan Kumar Ray (Awarded, 2018)
10. Impact of Climate and catchment dynamics on runoff generation by Negash Wagesho from Ethiopia jointly with Dr. M.K. Jain (Awarded, 2012)
11. Flood estimation and forecasting in Mahanadi River basin using soft computing techniques by Anil Kar jointly with Dr A.K. Lohani (Awarded, 2011)
12. Flood forecasting and early warning studies for parts of Bangladesh by Mizanur Rahman from Bangladesh jointly with Dr. D.S. Arya (Awarded, 2011)
13. Evaluation of temporal and spatial climatic variability over Indian Himalaya by S.K. Shrivastava, supervised jointly with Dr. Ranvir Singh and Dr. Pratap Singh (Awarded, 2011)
14. Hydrological modeling for flood flows by Mr. Shibayan Sarkar jointly with Dr. B.S. Mathur (awarded-2010)
15. Climate change studies: A spatio- temporal analysis for part of India by Ashoke Basistha jointly with Dr. D.S. Arya (Awarded- 2010)
16. Regional flood frequency estimation in India by Rakesh Kumar, supervised jointly with Dr. K.K.S. Bhatia (Awarded-2009)
17. ANN and fuzzy logic in hydrologic modeling and flow forecasting by A. K. Lohani, jointly with Dr. K.K.S. Bhatia (2008)
18. Effect of climatic changes on surface hydrological estimates by Mr. Manohar Arora, jointly with Dr. Pratap Singh (2005)
19. Estimation of extreme flows for ungauged catchments by Mr. V. K. Bhatt - jointly with Dr. B.S. Mathur (2003)
20. Operation of a multipurpose reservoir by Mr. S.K. Mishra, jointly with Dr. S. M. Seth and Dr D.K. Srivastava (1998)
21. Development of physically based flood frequency models by Mr. R.S. Kurothe, jointly with Dr. B.S. Mathur (1997)

M. Tech. THESES GUIDED:

1. Estimation of Design flood and Glacial Lake Outburst Flood (GLOF) for planning and Design of Hydroelectric Projects in the Himalayas, by Isly Issac, 2022-23
2. Comprehensive risk assessment of Maithon dam by Abhishek Shukla 2022-23
3. Projection of flood seasonality changes in a Garhwal Himalayas river basin due to global warming, by Prachi Singhal 2021-22 jointly with Ankit Aggarwal
4. Effect of additional spillway on downstream floods of Hirakud, by Lingaraj Nath; 2020-21
5. Design of Hydro-meteorological Network of Narayani River Basin, Nepal, by Dinkar Kayastha; 2020-21
6. Assessment of Water availability up to Daudhan dam site of Ken basin for Ken-Betwa link project by Shiva Kant Pandey, 2020-21
7. Challenges and opportunities of small-scale irrigation utilization in central Rift Valley basin of Dugda Worda, Ethiopia, by Obse Wegi Gebissa; 2020-21
8. Effect of Kalia Sot Dam, Bhopal on downstream floods under climatic and LULC changes by Satyajeet Shukla; CoEDMM (jointly with Harshit Lakra) 2020-21
9. Development of framework to address drought issues, by Arjun Kaushik; 2019-20
10. Regional flood frequency analysis for Narayani River basin, Nepal by Ram Kumar Kapair; 2019-20
11. Identification of hotspots and glacial lakes in Arunachal Pradesh by Vijitha Sree Thathireddy; CoEDMM, (jointly with Ajanta Goswami); 2019-20
12. Daily streamflow forecasting using stochastic models by Ally Diwani; 2018-19
13. Flood risk assessment for dams by Aman Kumar Singh; 2018-19
14. Flood hazard mapping for Roorkee area by Chaitanya; COEDMM, 2018-19
15. Hydrological aspects June 28, 2017 flood at IIT Roorkee by Ila Prakash; COEDMM, 2017-18
16. Geomorphological analysis and hydrological modelling of three Himalayan catchments of Nepal and India by Santosh Kumar Sah; 2017-18
17. Turbine testing under field conditions; by Desh Deepak; 2017-18
18. Flood Estimation in a river basin downstream of a major reservoir in coastal region by Jaya Ram Prajapati; 2016-17
19. Multivariate modelling of hydro-meteorological extremes by Sujan Tamrakar; 2015-16
20. Study on climate change in Sundarbans, Bangladesh by Nurul Hoque Upal; 2015-16
21. Glacial lake outburst flood studies over Indus basin by Mr. Shailesh Kumar; 2014-15
22. Climate Change Studies over Nepal by Mr. Sunil Poudel 2014-15
23. Flood estimation for rivers of Saurashtra region contributing into Gulf of Khambat by Miss Priyanka 2013-14
24. Analysis of Non-stationarity in hydro-meteorological data of Dhadhar river basin by Mr. Sunil Kumar, 2013-14
25. Simulation of June 2013 flood at Tehri dam, by Mr. Supindra Khatri 2013-14
26. Flood studies in and around Alaknanda basin by Mr. Y.K. Goel 2013-14
27. Flood estimation and forecasting studies for Tehri dam – Mr. Ashish Sinha 2012-13
28. Flood routing studies for VPHE project, Uttarakhand by Mr. Sujay Negi 2012-13
29. Simplified flood routing methods- Mr. M.M. Vishnu 2012-13
30. Hydrological reappraisal for Visnugad pipalkoti hydro-electric project by Sushil Himanshu 2011-12
31. Design flood estimation for Tehri dam using deterministic and statistical approaches by Ajay Kumar, 2011-12
32. Hydrological analysis for a coastal power project (2010-11), Keshav Bobade
33. Regional flood frequency analysis of Nepal rivers (2009-10) , Badri Karki from Nepal

34. Stochastic modeling of flood flows for Myanmar rivers (2009-10) by Lai Lai Winn from Myanmar jointly with Dr. A.K. Lohani
35. Climate change scenario generation using statistical downscaling (2009-10) by. N.P. Gautam from Nepal jointly with Dr. Manohar Arora
36. Bivariate Flood frequency analysis using Copulas (2009-10) by Siddartha Shankar Mishra, jointly with Dr. Aditi Gangopadhyay
37. Design flood and Scour depth computation at pipeline crossing (2008-09) , Ekta Sahay jointly with Dr. D.S. Arya and Dr. Sanjay Kumar
38. Modelling of snow melt component in the runoff of river Bhagirathi at Tehri (2008-09), Neeraj Agarwal, jointly with Dr. D.S. arya and Dr. Manohar Arora
39. Predictions in ungauged basins of Orissa (2007-08) , A.K. Kar
40. Flood predictions in MMRDA region, Mumbai (2007-08), D. Chakravorty
41. Stochastic modeling of Nile Flows (2007-08) by Eltag from Ethiopia
42. Climate change influences on hydrological extremes (2005-06) by S.K. Gangwar jointly with Dr. D.S. Arya
43. Flood risk mapping by Dhruv Dhirendra (2005-06) jointly with Dr. D.S. Arya
44. Flood hazard Assessment of Chitwan District in Nepal (2004-05) by Bhupendra Gauchan from Nepal jointly with Dr. D.S. Arya
45. Flood risk mapping in the lower part of Chindwin River in Myanmar (2004-05) by Htay Htay Than from Myanmar, jointly with Dr. D. S. Arya
46. A critical appraisal of flood forecasting models by G.B. Pattnaik (2003-04) jointly with M.Perumal
47. Extreme value estimation for hydro-meteorological data by Shiv Kumar (2003-04)
48. Water availability aspect of Inter-basin water transfer by Goutam Chandra Das (2003-04) jointly with B.S. Mathur
49. Temporal and spatial analysis of rainfall in Uttaranchal (2003-04) by Ashok Basistha jointly with D.S. Arya
50. Stochastic analysis of daily rainfall data between Bargi and Hoshangabad by Y.K. Dhama (2002-2003) jointly with Dr. K.S. Ramasastri
51. Stochastic analysis of high frequency ground water data by S.M. Deshpande (2001-2002)
52. Estimation of flood quantiles from non stationary flood series by R.B. Jigajinni (2000-2001)
53. Hydrologic modelling of snow fed river basin by T. Thomas (1999-2000) jointly with Dr. S.M. Seth and Dr. Pratap Singh
54. Flood Frequency modelling for Beas basin upto Pandoh by R.K. Jaiswal (1999-2000) jointly with Dr. S.M. Seth and Dr. Pratap Singh
55. Streamflow forecasting using linear perturbation model & ANN approach by N. Vivekanandan (1999-2000) jointly with Dr. D.S. Arya
56. Flood estimation for Bagamati river at Pandhera Dhoban, Nepal by L.D. Shrestha from Nepal (1999-2000) jointly with Dr. B.S. Mathur
57. Frequency analysis of censored data by Aberra Chala Buba from Ethiopia (1998-99) jointly with Dr. D.K. Srivastava
58. Streamflow forecasting using ANN by Fikru Gemtecha from Ethiopia (1998-99) jointly with Dr. D.S. Arya
59. Stochastic modelling of ground water levels by A.K. Agarwal (1997-98) jointly with Dr. D.C. Singhal
60. Flood frequency analysis for ungauged sites of central India by Jemal Reshid Shafi from Ethiopia (1997-98)

61. Event-based rainfall-runoff modelling using geomorphological characteristics by M.K. Sharma (1996-97) jointly with Mr. R. D. Singh
62. Analysis of hydro-meteorological data by A.K. Dwivedi (1996-97) jointly with Mr. Hemant Chaudhary
63. Richard's equation assisted flood hydrograph computation by kinematic wave approach by Manoj Kumar Singh (1995-96) jointly with Dr. Deepak Kashyap
64. Flood frequency studies using L-moments by Bhopal Singh (1995-96)
65. Regional flood frequency analysis for Central India by Jyoti Prasad (1994-95).
66. Development of daily rainfall generation model by Vu Hong Chau from Vietnam, (1993-94).
67. Rainfall runoff modelling by Adil Yassin Mohamed frm Sudan, (1993-94), jointly with Mr. R.D. Singh.
68. Analysis of daily rainfall and runoff data of Serang river basin, Indonesia by Sutjipto from Indonesia, (1993-94).
69. Flood forecasting using geomorphological instantaneous unit hydrograph by Abdul Qayeum Karim from Afghanistan (1992-93).
70. Flood frequency analysis using two step power transformation by Satyabrata Banerjee (1991-92).
71. Derivation of Nash model parameters from geomorphological instantaneous unit hydrograph by R.K. Panigrahi (1991-92) jointly with Mr. R.D. Singh
72. Studies on general extreme value distribution by Manik De (1990-91).
73. A comparative study of regional flood frequency methods by James U. Ikoi from Nigeria (1989-90).
74. Hydrological studies for Manibhadra Dam project by J.K.Rath (1989-90).
75. Regional flood frequency analysis of Mekong River basin, Laos by Panyasiri Sang from Lao PDR (1988-89).
76. Flood estimation in river Jhelum basin using statistical approach by M.A. Lone, (1988-89) jointly with Dr. B.S. Mathur
77. Comparison of monthly streamflow models by Rajeshwar Mehrotra (1988-89).

BOOK (S)/ Book Chapters:

1. Singhal, D.C., Goel, N.K., Srivastava, D.K., Singh, Ranvir, Joshi, H. and Mathur, B.S. (1997), ' Emerging Trends in Hydrology' Edited Proceedings of International Symposium on 'Emerging Trends in Hydrology' Sept. 25-27, 1997, Jain Printers, Roorkee. (Volume I)
2. Perumal, M., Singhal, D.C., Arya, D.S., Srivastava, D.K., Goel, N.K., Mathur, B.S., Joshi, H., Singh, R., Nautiyal, M.D. (2005)' Hydrological Perspectives for Sustainable Development', Edited Proceedings of International Conference ' Hydrological Perspectives for Sustainable Development' Feb. 23-25, 2005, Allied Publishers Pvt. Ltd.
3. 'Development of a Fuzzy Flood Forecasting Model for Downstream of Hirakud Reservoir of Mahanadi Basin, India' by A.K. Kar, A.K. Lohani, N.K. Goel, and G.P. Roy in Book entitled 'River System Analysis and Management' by Nayan Sharma (Ed), Springer Science +Business Media Singapore 2017, ISBN 978-981-10-1472-7, pp 211-218.

TECHNICAL PAPERS IN REFEREED JOURNALS:

1. Macedoa, M.B.D, Mendiondo, E.M., Razzolinia, M.T.P., Goel, N.K., Arya, D.S., Kurian, M., and Nardocci, A.C. (2022), 'Multi-stage resilience analysis of the nexus flood-sanitation-public health in urban environments: a theoretical framework', Urban Water Journal, https://doi.org/10.1080/1573062X.2022.2047737
2. Hailesilassie1, W.T., Goel, N.K., Tenalem, A., and Sitrrak, T. (2022),'Future precipitation changes in Central Ethiopian Main Rift under CMIP5 GCMs', Journal of Water and Climate Change, https://doi.org/10.2166/wcc.2022.440
3. Sheikh, U., Lone, M.A., Goel, N.K., and Zakwan, M. (2022), 'Trend analysis of Hydro-meteorological parameters in the Jhelum River basin ¸ Northwestern Himalayas', Theoretical and Applied Climatology, https://doi.org/10.1007/s00704-022-04014-7
4. Umar, S, Lone, M.A., Goel, N.K. (2021), 'Modeling of annual rainfall extremes in the Jhelum River basin, Northwestern Himalayas', Sustainable Water Resources Management, 7:59 https://doi.org/10.1007/s40899-021-00539-3
5. Umar, S, Lone, M.A., Goel, N.K. (2021), 'Modeling of peak discharges and frequency analysis of floods on the Jhelum river, North Western Himalayas', Modeling Earth Systems and Environment, 7:1991–2003 https://doi.org/10.1007/s40808-020-00957-w
6. Ray, L. K., and Goel, N.K. (2021), 'Spatio-temporal change in rainfall over five different climatic regions of India', Journal of Water and Climate Change, 12(7), https://doi.org/10.2166/wcc.2021.052
7. Chowdhury, B., Goel, N.K., and Arora, M. (2020), 'Evaluation and ranking of different gridded precipitation datasets for Satluj River basin using compromise programming and f-TOPSIS', Theoretical and Applied Climatology, 143 (1), 101-114; Correction 143(1) 115-117. https://doi.org/10.1007/s00704-020-03405-y
8. Ray, L.K., Goel, N.K. and Arora, M. (2019), 'Trend analysis and change point detection of temperature over parts of India', Theoretical and Applied Climatology, 138 (1), 153-167. https://doi.org/10.1007/s00704-019-02819-7
9. Ray, L.K. and Goel, N.K. (2019), 'Flood frequency analysis of Narmada River basin in India under Non-stationary condition: A case study', Journal of Hydrologic Engineering, in production (DOI: 10.1061/(ASCE)HE.1943-5584.0001808). https://doi.org/10.1061/(ASCE)HE.1943-5584.0001808

4. Tamarakar, S., Goel, N.K. (2018), 'Development of intensity duration frequency relationships for Port Blair, Andaman and Nicobar Islands, India', Mausam 69,1, pp123-132. https://mausamjournal.imd.gov.in/index.php/MAUSAM/article/view/241/180

5. Ruiz-Villanueva, V. Allen, S., Arora, M., Goel, N.K., and Stoffel, M. (2016), 'Recent catastrophic landslide lake outburst floods in the Himalayan mountain range', Progress in Physical Geography, 0309133316658614- Impact Factor 2.728. https://doi.org/10.1177/0309133316658614

6. Gautam, N.P., Arora, M., Goel, N.K., and Kumar, A.R.S. (2016), 'Investigating the impact of climate change on future runoff of river Satluj', Journal of Hydrology and Meteorology 8 (1), 10-21. Impact Factor – Not available. https://doi.org/10.3126/jhm.v8i1.15568

7. Kar, A.K., Lohani, A.K., Goel, N.K., and Roy, G.P. (2015), 'Rain gauge network design for flood forecasting using multi-criteria decision analysis and clustering techniques in lower Mahanadi River basin, India', Journal of Hydrology: Regional Studies, Vo. 4, pp. 313-332. Impact Factor (Journal of Hydrology) 3.882. https://doi.org/10.1016/j.ejrh.2015.07.003

8. Kumar, R., Goel, N.K., Chatterjee C., and Nayak, P.C. (2015),'Regional flood frequency analysis using soft computing techniques', Water Resources Management, Springer Science, DOI 10.1007/s11269-015-0922-1.- Impact Factor 2.437. https://doi.org/10.1007/s11269-015-0922-1

9. Lohani, A.K., Goel, N.K., and Bhatia, K.K. S. (2014), 'Improving Real Time Flood Forecasting Using Fuzzy Inference System', Journal of Hydrology, Elsevier, Vol. 509, pp. 25-41. Impact Factor 3.882. https://doi.org/10.1016/j.jhydrol.2013.11.021
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2. Goel, N. K. and Bisht, M. S. (2023), "Performance evaluation of Operational Inflow Forecasting System for Tehri dam, India, from November 2018 to August 2023" on International Conference on Dam Safety-2023, Jaipur on September 14 to 15, 2023.
3. Goel, N. K., Sharma, M. L. and Ahmad, Z. (2023), "International Centre of Excellence for Dams at IIT Roorkee - Framework and Opportunities" on International Conference on Dam Safety-2023, Jaipur on September 14 to 15, 2023.
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6. Issac, I., Goel, N. K. and Rai, N. N. (2023), "Approach and methodology for estimating combined glacial lake outburst flood (GLOF) and PMF design flood for Bajoli Holi hydro-electric project in the Indian Himalayas", EGU General Assembly 2023, Vienna, https://doi.org/10.5194/egusphere-egu23-15819.
7. Goel, N. K. (2023), Special lecture on "Operational Inflow Forecasting for Hydropower Schemes" Delivered online on March 24, 2023 for 10-day training program on "Hydrological and Hydraulic Modelling and Its Applications in Natural Resources Management" March 20 to 29, 2023, SKUAST, Srinagar, Kashmir

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11. Nath, L., Kaushik, A. and Goel, N. K. (2021), 'Drought analysis at the downstream of Hirakud dam in Mahanadi basin', e-poster in 5th Global Summit of GADRI: Engaging Sciences with Action, virtual Intercontinental Conference, organised by the GADRI Secretariat together with the Regional Alliances, 31st August to 1st September 2021.
12. Goel, N.K. (2021), 'Development of an Operational Inflow Forecasting System for Tehri Dam' in International Conference on Recent Advances in Civil Engineering for Sustainable Development (RACESD- 2021) during February 13-14, 2021, organised by MANIT Bhopal
13. Goel, N.K. (2020), 'Recent developments in in flood forecasting and warning in India' in Webinar on "Flood Management in India", Sept. 25, 2020, organised by IIT Roorkee.
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27. Goel, N. K. (2015),' Flood frequency analysis under land use and climate changes', invited presentation at Interdisciplinary Programme in Climate Studies at the Indian Institute of Technology Bombay, August 5, 2015.
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53. Lone, M.A., and Goel, N.K. (2007),' Estimation of floods for some important sites of Jhelum river basin, using statistical approach', Proceedings of HYDRO 2007, National conference on Hydraulics and Water Resources, NIT Surat, Dec. 21-22, 2007.
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55. Arya, D.S. Gauchan, B., and (2006), Goel, N. K. (2006),' Flood Plain Mapping for East Rapti River, Nepal Using GIS and HEC-RAS', proceedings of 7th International conference on Hydroinfomatics, Nice, France, Sept. 4-6, 2006.

56. Goel, N.K., Than, H.H. and Arya, D.S. (2005),' Flood risk mapping in the lower part of Chindwin river basin (Myanmar)' Proceedings of International Conference on Flood Forecasting Technology, Tromso, Norway, Oct. 17 to 19, 2005.
57. Lohani, A.K., Goel, N.K., Bhatia, K.K.S. (2005),'Development of fuzzy logic based real time flood forecasting system for river Narmada in central India', Proceedings of International Conference on Flood Forecasting Technology, Tromso, Norway, Oct. 17 to 19, 2005.
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60. Arora, M. Singh, P., Goel, N.K., and Singh, R.D. (2005),' Effect of climate change on flow regime of glacierized Himalayan basin' Proceeding of International conference 'Hydrological Perspectives for Sustainable Development- HYPESD -2005' Roorkee, Feb. 23-25, 2005.
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65. Goel, N.K. (1998), 'Flood estimation in sub Himalayan region using L moments', International Symposium on ' Hydrology of ungauged streams in Hilly regions for small hydro power development', New Delhi, March 9-10, 1998.
66. Mishra, S.K., Goel, N.K., Seth, S.M. and Srivastava, D.K. (1998), 'An SCS- CN based long term daily flow simulation model for a hilly catchment', International Symposium on ' Hydrology of ungauged streams in Hilly regions for small hydro power development', New Delhi, March 9-10, 1998.
67. Goel, N.K. and Seth, S.M. (1997),'Probabilistic modelling of peak, volume and duration characteristics of flood flows', Proceedings of International Symposium on Emerging Trends in Hydrology, Roorkee, Sept. 25-27, 1997.
68. Lone, M.A., Goel, N.K. and Mathur, B.S. (1996),' Performance of various flood estimation methods for Jhelum river basin', Proceedings of International Conference on 'Disasters and Mitigation' held at Madras (India), Jan. 19-22, 1996.
69. Goel, N.K. (1995),' Hydrological hazards- prevention and mitigation' Workshop on ' Strengthening of community participation in disaster reduction and role of NGO's' Vigyan Bhawan, New Delhi, Jan. 13-15, 1995.
70. Goel, N. K., Sinha, L. P. and Kashyap, D. (1995),' Flood hydrograph computation using Green and Ampt model', proceeding of National Symposium on 'Hydrology of Arid and Semi-arid Regions' Jaipur, Oct. 5-7, 1995.

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74. Mathur, B.S., Singh, R., Goel, N.K., Tiwari, A.K. and Kurothe, R.S. (1993), 'Rainfall runoff erosion modelling for Indian watersheds', Proceedings of National Seminar on 'Hydrological Hazards- Prevention and Mitigation', Roorkee, March 17-18, 1993.
75. Goel, N.K., Mathur, B.S. and Lone, M.A. (1989), 'Flood estimation in Kashmir valley using regional flood frequency analysis approach', Proceedings of National Seminar on 'Hydrology', Jammu, Jan.4-5, 1989.
76. Mathur, B.S. and Goel, N.K. (1989), 'Was July 5, 1988 storm at Roorkee an unusual one?', Proceedings of regional workshop on 'Unusual storm events and their relevance to dam safety' Narmadasagar dam site, Sept. 1989.
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78. Goel, N.K. and Seth, S.M. (1988), 'Comparative study of different parameter estimation techniques for EV1 distribution', Proceedings of International Seminar on 'Hydrology of Extremes', Roorkee, Dec.l-3, 1988.
79. Goel, N.K., Seth, S.M. and Chandra Satish (1987), 'Design flood estimation of Narmada Sagar project using partial duration series - a case study', in V. P. Singh (editor), 'Application of frequency and risk analysis in water resources' Reidel, Dordrech, pp.113-122.
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81. Goel, N.K. and Seth, S.M. (1985), 'Data related problems in frequency analysis' Proceedings of National Seminar on 'Flood Frequency Analysis', New Delhi, Sept. 30, 1985.
82. Seth, S.M. and Goel, N.K. (1985), 'Regional flood frequency analysis' Proceedings of National Seminar on 'Flood Frequency Analysis', New Delhi, Sept. 30, 1985.
83. Goel, N.K. and Seth, S.M. (1985), 'Tentative spillway design flood estimation for Narmada Sagar Project', Proceedings of National Seminar on 'Flood Frequency Analysis', New Delhi, Sept.30, 1985.
84. Goel, N.K. and Chander, S. (1984), 'Flood stage forecasting using ARMAX models', Proceedings of National Seminar on 'Real Time Forecasting', New Delhi, Oct. 3l, 1984.
85. Soni, B., Goel, N.K. and Singh, J. (1984), 'Probable rainfall for integrated planning - a mixed distribution approach', Proceedings of National Seminar on 'Hydrology', Poona, June 29 to July 7, 1984.

TECHNICAL REPORTS

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2. Goel, N.K. (1988), 'Forecasting of monsoon runoff using data from specific basins', National Institute of Hydrology Technical Report no.TR-43.

3. Seth, S.M. and Goel, N.K. (1987), 'Comparative study of different parameter estimation techniques for EV-l distribution', National Institute of Hydrology Technical Report no. TR-36.
4. Goel, N.K. (1986), 'Simple technique for forecasting of monsoon rainfall and runoff and application to Mahanadi river at Hirakud', National Institute of Hydrology Technical Report no.TR-l7.
5. Seth, S.M., Goel, N.K. and Nirupma, P. (1987), 'Application of bivariate Thomas Fiering model for monthly streamflow generation in Mahanadi river basin', National Institute of Hydrology Technical Report no. CS-19.
6. Seth, S.M. and Goel, N.K. (1986), 'Some studies on plotting position formuae for Gumbel EV- 1 distribution', National Institute of Hydrology Technical Report no. TR-9.
7. Seth, S.M. and Goel, N.K. (1986), 'Techniques for flood frequency analysis', National Institute of Hydrology Technical Report no. UM-24.
8. Seth, S.M. and Goel, N.K. (1985), 'Partial duration series models', National Institute of Hydrology Technical Report no. CS-ll.
9. Seth, S.M. and Goel, N.K. (1985), 'Time series analysis models', National Institute of Hydrology Technical Report no. RN-l8.
10. Seth, S.M. and Goel, N.K. (1985), 'Flood forecasting models', National Institute of Hydrology Technical Report no. RN-35.
11. Goel, N.K. (1984), 'Time series analysis', National Institute of Hydrology Technical Report no. IND/74/045.
12. Seth, S.M. and Goel, N.K (1984), 'Frequency analysis', National Institute of Hydrology Technical Report no. UM-2.
13. Seth, S.M., Goel, N.K. and Bhatia K.K.S. (1984), 'Monthly streamflow generation', National Institute of Hydrology Technical Report no. CS-8.
14. Seth, S.M. and Goel, N.K. (1984), 'Partial duration series models', National Institute of Hydrology Technical Report no.RN-5.
15. Seth, S.M., Perumal, M. and Goel, N.K. (1983), 'Development and application of programme on power transformation method to flood frequency analysis - A comparative study with other normalization procedures', National Institute of Hydrology Technical Report.

SPONSORED RESEARCH PROJECTS HANDLED

1. Establishment of International Centre of Excellence for dams, sponsored by Ministry of Jal Shakti, **Rs 108.99 crores**, 2022-23, PI along with 2 theme leaders and other investigators.
2. Theory of Change Observatory on Disaster Resilience, joint project sponsored by Belmont Forum; participating as associated partner with University of Sao Paulo, Brazil; 2020-2022.
3. Analysis of Climate Change and Urban Heat Island Impact in Dehradun, Uttarakhand, sponsored by DST; Rs 62 lakhs; 2018-19, as Co-PI.
4. Capacity Building of IIT Roorkee in the Area of Dam Safety; Sponsored by Ministry of Water Resources, River Development and Ganga Rejuvenation; Rs 10.92 Crores, 2017-18.
5. Meteorological Data Collection, Monitoring, Processing and Analysis to Evaluate Climate Variability in the State of Uttaranchal under U-PROBE sponsored by Department of Science and Technology, Government of India Amount Rs. 23.5 lakhs; 2002-03 Completed.
6. Development of spatial water and climate information system for the state of Uttaranchal under U-PROBE sponsored by Department of Science and Technology, Government of India Amount Rs. 13.68 lakhs Completed.; 2003-04.
7. Studying meandering and shifting behaviour of the Ganges River in plains of Uttarakhand UCOST, Dehradun, India- 2012-13 Completed. Rs. 2.5 Lakhs; as Co-PI.

8. Inventorisation of Industries Using Web and GIS based Techniques for Hardwar and Udham Singh Nagar Districts, UCOST, Dehradun, India- 2010-11 Completed.; 6.6 lakhs, as Co-PI.
9. Development of Dynamic Flood frequency models- sponsored by Min. of Water Resources Rs. 3.60 lakhs; 1996 Completed.

CONSULTANCY PROJECTS HANDLED AS PI/ Co-PI

1. Dam Break Analysis and Disaster Management Plan of Tuirial Dam; sponsored by NEEPCO Ltd., 2023-24, 21 Lakhs; as Co-PI
2. Development of operational Inflow forecasting system for Chamera 3 project; sponsored by NHPC Ltd., 2020-2023, 1.36 Crores.
3. Real-time flood forecasting system for Tehri dam:
   - Phase I - Development of operational real time flood forecasting system for Tehri dam, sponsored by THDCIL; 1.21 Crores, 2011-12.
   - Phase II - Improvement in Real Time Inflow Forecasting System, sponsored by THDCIL; 48.95 lakhs, 2019-20.
   - Phase III - Inflow Forecasts for Tehri Dam Using Operational Inflow Forecasting System, sponsored by THDCIL; 29.09 lakhs, 2020-21.
   - Phase IV - Issuing Inflow Forecasts for Tehri Dam Reservoir Using Operational Inflow Forecasting System, sponsored by THDCIL; 36.81 lakhs, 2021-22.
   - Phase V - Issuing Inflow for Tehri Dam Using Operational Inflow Forecasting System, sponsored by THDCIL; 37.76 lakhs, 2022-23.
4. Development of Water Resources Information System; Third party Evaluation; Sponsored by Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation; 24.78 Lakhs. Completed; 2021- 2022.
5. Flood routing studies for Kol Dam, sponsored by NTPC Ltd. 2020-21 Rs 18.88 lakhs. Completed. 2021-2022.
6. Vetting of reports of Disaster Risk Assessment of Uttarakhand, sponsored by Uttarakhand Disaster Recovery Project; Rs. 1.62 crores; 2017-18; as Co- PI.
7. Estimation of PMF, design flood including determining spillway capacity for Gulf of Khambat development Project- Kalpasar project', sponsored by Kalpasar Department, 69.39 lakhs, 2012-13 Completed in 2018.
8. Climate Proofing of Springshed Development Programme, sponsored by UNDP; 14.0 lakhs; Co-PI. 2019-2021, as Co-PI
9. Area drainage study in and around HPCL, Rajasthan Refinery Ltd., Pachpadra, Barmer; sponsored by EIL; Rs. 11.8 lakhs (2018-19); Contributed as Co- PI.
10. Study of the migration/ meandering behavior of River Midhola in Distt Surat; sponsored by GAIL (India) Limited. (Rs 7.965 lakhs); 2017-18, Completed.
11. Performance Evaluation of Dam Rehabilitation and Improvement Project (DRIP); 2017-18 sponsored by MoWR, RD &GR; 23.6 lakhs Completed.
12. Ground water coloration studies near Shabajpur village, sponsored by Jubilant Life Sciences Limited, Gajraula, 14.97 Lakhs 2013-14 Completed.
13. Revision of guidelines of estimation of design basis flood for inland nuclear power plants, AERB, Rs. 10 lakhs, 2014-15; Completed.
14. Review of hydrological report of VSI airport, Port Blair, Airports Authority of India, Rs. 15.17 lakhs Completed.

15. Ground water and soil remediation measures near CTO-V, Hyderabad, Dr Reddy's, 13.1 lakhs 2014-15; Completed.
16. Hydrology and power potential studies for Vishnugad Pipalkoti HEP, sponsored by THDC Ltd. 13.23 lakhs, 2011-12 Completed.
17. Review of reports and drawings of South dump site for Chenani- Nashri tunnel J&K, sponsored by Leighton Contractors India Pvt. Ltd. and NHAI amount Rs. 7.3 lakhs, 2013-14 Completed.
18. Review of reports and drawings of dump sites for Chenani- Nashri tunnel J&K, sponsored by Leighton Contractors India Pvt. Ltd. and NHAI amount Rs. 25.3 lakhs, 2012-13 Completed.
19. Hydrological Assessment for Chenani- Nashri tunnel area, sponsored by Leighton Contractors India Pvt. Ltd. and NHAI amount Rs. 11.47 lakhs, 2011-12 Completed.
20. Hydrological study near Shamsabad area by GMR, Year 2010-11, Amount Rs.16.7 Lakhs Completed.
21. GLOF studies for two sub-basins in Twang basin, Arunachal Pradesh, Sponsored by SEW Infrastructure, Hyderabad. Rs. 15.6 lakhs, 2011-13 Completed, as Co-PI.
22. Data validation for SEW project sites, Sponsored by SEW Infrastructure, Hyderabad. Rs. 5.0 lakhs, 2011-12 Completed, as Co-PI.
23. Velocity and Cross Section Measurements of Chilla Canal, sponsored by DLZ Power Pvt. Ltd., Pune, 2009-10, Rs. 5.6 lakhs Completed, as Co-PI.
24. Meandering behavior of river Ramganga and Ganga near Farrukhabad, sponsored by GAIL (India), limited, Rs. 21 lakhs – year 2009-10 Completed.
25. Processing and verification of discharge data of river Tamaklata and Alaknada, sponsored by R.K. Engineering, Roorkee, Rs. 5.5 lakhs, year 2009-10 Completed, as Co-PI.
26. Ground water coloration studies near Shabajpur village, sponsored by Jubilant Organosys, Gajraula, 5.5Lakhs - year 2010 Completed.
27. Ground water coloration studies near Shabajpur village, sponsored by Jubilant Organosys, Gajraula, 6.7 Lakhs - year 2009 Completed.
28. Series extension and design energy computations for Tehri dam, sponsored by THDC Ltd., 2.2 lacks – year 2009-10 Completed.
29. Study and Analysis of observed data of Suketi Khad, Kansa Khad and River Beas Sponsored by Bhakra Beas Management Board, Year 2008-09, Amount Rs. 7.86 Lakhs Completed.
30. Hydrological Survey at Koteswar Power Station – Water Supply and Geophysical Investigations Sponsored by Power Grid Corporation of India, Year 2008-09, Amount Rs. 2.25 Lakhs Completed.
31. Review of Gomti Nagar (extension) Drainage Design Sponsored by Lucknow Development Authority, Year 2008-09, Amount Rs. 6.75 Lakhs – Completed, as Co-PI.
32. Review of Hydrological Aspects of TATO – II and SIYOM HE-Project Sponsored by Reliance, Year 2008-09, Amount Rs. 6.75 Lakhs Completed.
33. Reconnaissance Study Around GHIAL Sponsored by GMR, Year 2008-09, Amount Rs.1.12 Lakhs Completed.
34. Hydrological Studies at Cuttack, Orissa, Sponsored by M/S WAPCOS, Year 2008-09, Amount Rs. 5.05 Lakhs Completed.
35. River Migration Studies, Design Flood Studies, Sponsored by L&T, Year 2008-09, Amount Rs. 29 Lakhs Completed.
36. Review of Hydrology of Tehri dam, sponsored by THDC, Year 2008-09, Amount Rs. 4.5 lacks Completed.
37. Urban drainage design for Jaipur city, sponsored by Jaipur Development Authority, Year 2008-09, Amount 7.86 Lakhs Completed.
38. Evaluation Study of completed Research schemes under the R&D Programme of MoWR, sponsored by Ministry of Water Resources, New Delhi, year 2006-07, amount Rs. 13.5 Lakhs Completed, as Co-PI.
39. Hydrological study for Song dam, Amount Rs. 1.0 Lakhs Completed, as Co-PI.

40. State level master plan for SHP Potential sites in Chhattisgarh, as Co-PI. Completed.
41. Strengthening Disaster Mitigation and Management at State level in India, as Co-PI, Asian Disaster Preparedness Center, (Flood Plans for UP) Completed.
42. Regional flow regimes estimation for small scale hydropower assessment (REFRESHA) Co-PI, Completed.
43. External Drainage Design for Kosi Kotwan Industrial Estate of UPSIDC Co-PI Completed.
44. Preparation of detailed project for the conservation and management of Dal-Nagin Lake in Srinagar (J&K) Co-PI, Completed.
45. External drainage design for TRONICA city, UPSIDC project, Co-PI (1998), Completed.
46. Testing of pan Evaporimeters (1998), M/s Delite Engineering Works, Roorkee, Completed.
47. Hydrology study for integrated steel plant, Satarda, Usha Ispat Ltd. (1997), Co-PI, Completed.
48. Development of hydrological watershed simulation model (phase-l) Review and recommended approach, Ministry of Agriculture, New Delhi, (1992), Co-PI, Completed.
49. Design flood estimation for Kishau dam, National Institute of Hydrology (1989), Co-PI, Completed.
50. Water availability studies for Mahanadi River basin at three sites, National Institute of Hydrology (1986), Co-PI, Completed.
51. Design flood estimation for Narmada Sagar and Sardar Sarovar Project, National Institute of Hydrology, (1985), Co-PI, Completed.

SPONSORED SHORT TERM COURSES

1. Hydrological Analysis and Planning for the Hydro and Thermal power projects, March 13-17, 2023, Sponsored by NTPC Ltd.
2. Design flood estimation for gauged catchments, August 17-19, 2020, Sponsored by Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, GoI.
3. Design flood estimation for ungauged catchments, August 20-21. 2020, Sponsored by Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, GoI.
4. Design flood estimation for gauged catchments, September 16-18, 2019, Sponsored by Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, GoI.
5. Design flood estimation for ungauged catchments, September 19-20, 2019, Sponsored by Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, GoI.
6. Open data Sources: Spatiotemporal analysis; March 19-24, 2018, sponsored by National Hydrology project, Ministry of Water Resources, River Development and Ganga Rejuvenation, GoI, as Co-PI.
7. Water Resources Management: Jan. 8-27, 2018, for participants of Africa, sponsored by East and Southern African Division, Ministry of External Affairs, Govt. of India, as Co-PI.
8. Investigation, remediation and Management of Soil and groundwater Contaminated sites; Nov. 20-22, Sponsored by Central Pollution Control Board, as Co-PI.
9. Open data Sources: Spatiotemporal analysis; Oct. 9-14, 2017, sponsored by National Hydrology project, Ministry of Water Resources, River Development and Ganga Rejuvenation, GoI, as Co-PI.
10. River basin planning using HEC software; February 20-25, 2017, sponsored by National Hydrology project, Ministry of Water Resources, River Development and Ganga Rejuvenation, GoI, as Co-PI.
11. River basin planning using HEC software; September 5-10, 2016, sponsored by National Hydrology project, Ministry of Water Resources, River Development and Ganga Rejuvenation, GoI, as Co-PI.
12. River basin planning using HEC software; July 11-16, 2016, sponsored by National Hydrology project, Ministry of Water Resources, River Development and Ganga Rejuvenation, GoI, as Co-PI.
13. River basin planning using HEC software; May 16-23, 2016, sponsored by National Hydrology project, Ministry of Water Resources, River Development and Ganga Rejuvenation, GoI, as Co-PI.

14. Flood forecasting and Warning; October 26-30, 2015, International short term training course sponsored by World Meteorological Organization, Geneva, as Co-PI.
15. Flood estimation and forecasting; Sept. Feb. 22-27, 2015, for the officers of Tamil Nadu water Resources Department.
16. Hydrological analysis and planning for water resources projects; July 13-18, 2014, for the officers of Tamil Nadu water Resources Department.
17. Climate change issues and impacts on water resources management in coastal and seasonal wetlands, April 7-17, 2014, for the officers of BWDB, Bangladesh.
18. GIS and Remote sensing applications in water resources projects, Feb. 9-14, 2014, for the officers of Tamil Nadu water Resources Department.
19. Climate change issues and impacts on water resources management in coastal and seasonal wetlands, June 9-19, 2013, for the officers of BWDB, Bangladesh.
20. Climate change issues and impacts on water resources management in coastal and seasonal wetlands, March 11-20, 2013, for the officers of BWDB, Bangladesh.
21. Remote sensing and GIS applications in hydro-power projects, Jan. 21-23, 2013, for the officers of NHPC Ltd.
22. Remote sensing and GIS applications in hydro-power projects, Jan. 14-18, 2013, for the officers of NHPC Ltd.
23. Hydrological analysis for water resource planning and management in environmental aspects, June 11-22, 2012, for the officers BWDB, Bangladesh
24. Climate change effect on flood estimates and hydrological variables, March 5-14, 2012, for the officers BWDB, Bangladesh
25. Crop Water Management, Dec. 13-17, 2011, for the officers of minor Irrigation, Govt. of Orissa.
26. Estimation of design flood and design of spillways for minor irrigation projects Dec. 1-5, 2011, for the officers of minor Irrigation, Govt. of Orissa.
27. Remotes sensing and GIS applications for hydro-power projects, October 19-21, 2011, for the officers of NHPC Ltd.
28. Hydrological and water resources planning for minor irrigation projects, Sept 26-30, 2011, for the officers of minor Irrigation, Govt. of Orissa.
29. Remotes sensing and GIS applications for hydro-power projects June 20-22, 2011, for the officers of NHPC Ltd.
30. Flood estimation in a changing climate March 5-12, 2011, for the officers of Institute of Water Modeling, Govt. of Bangladesh
31. Urban flood modeling and drainage design, March 22-27, 2010, sponsored by Govt. of Sri Lanka
32. Remote sensing and GIS applications for Hydro-power projects, Feb. 22-27, 2010, sponsored by NHPC Ltd.
33. Ground water resource evaluation in Hard rock areas, Oct. 19- 24, 2009, sponsored by ground water Department, Govt. of Andhra Pradesh
34. Hydrological Analyses and Planning for Water Resources Projects with Exposure to Emerging Tools, Nov. 16 – 21, 2008, sponsored by Maharashtra Water Resources Department
35. Urban Flood Modeling and Drainage Design, Sept. 22 – 27, 2008, sponsored by MMRDA
36. Planning Analyses and Modeling of Groundwater in Hard Rock Areas, Sept. 01- 06, 2008 Sponsored by GSDA, Pune, Govt. of Maharashtra
37. Planning Analyses and Modeling of Groundwater in Hard Rock Areas, Aug. 18- 23, 2008, sponsored by Department of Mines and Geology, Govt. of Karnataka
38. Groundwater Planning, Analyses and Modeling in Hard Rock Areas, sponsored by Department of Mines and Geology, Govt. of Karnataka, July 21 – 26, 2008

39. Hydrological Analyses and Planning for Hydro Power Project, June 9-14, 2008, sponsored by NHPC Ltd.
40. Hydrological Analyses and Planning for Hydro Power Project, Dec. 17-22, 2007, sponsored by NHPC Ltd.
41. Hydrological Analyses and Planning for Hydro Power Project with emphasis on Design flood Estimation, Oct. 1-6, 2007, sponsored by Damodar Valley Corporation
42. Design flood analysis for hydropower projects, Aug. 20-25, 2007, sponsored by NTPC Ltd.
43. Hydrological Analyses and Planning for Hydro Power Project with emphasis on Design flood Estimation, Jul 2-7, 2007, sponsored by NHPC Ltd.
44. Hydrological Analyses and Planning for Hydro Power Project with emphasis on Design flood Estimation. Feb. 19-24, 2007, sponsored by Satluj Jal Vidyut Nigam Ltd.
45. Hydrological analyses and planning for Hydropower projects with emphasis on design flood estimation, Dec. 18-23, 2006, sponsored by Damodar Valley Corporation.
46. Urban flood disaster modeling and management Oct. 16-21, 2006, in joint collaboration with UNESCO-IHE, Netherlands, funded by NUFFIC, as Co-PI.
47. Hydrological analyses and planning for Hydropower projects with emphasis on design flood estimation, July 31-Aug. 5, 2006, sponsored by NHPC Ltd.
48. Hydrological analyses and planning for Hydropower projects, June 5-10, 2006, sponsored by NTPC Ltd.
49. Flood estimation using Unit Hydrograph Techniques, April 15-19, 1985, at National Institute of Hydrology as Scientist of NIH.
50. Flood frequency analysis, May 13-17, 1985, at National Institute of Hydrology as Scientist of NIH.
51. Flood frequency analysis, Oct. 7-10, 1985, at Guwahati as Scientist of NIH.
52. Flood frequency analysis, Dec. 16-20, 1985, at Calcutta as Scientist of NIH
53. Observation, processing and analysis of precipitation data, Feb. 24- 28, 1986 at National Institute of Hydrology as Scientist of NIH.
54. Flood frequency analysis, August 25-30, 1986, at Bhubaneswar as Scientist of NIH
55. Flood routing flood forecasting, Nov. 10- 14, 1986 at National Institute of Hydrology as Scientist of NIH.
56. Flood estimation using Unit Hydrograph Techniques, Nov. 24- 28, at KERS, Mysore as Scientist of NIH
57. Design storm and design flood, Jan. 5-9, 1987, at National Institute of Hydrology as Scientist of NIH.
58. Reservoir operation, April 6-10, 1987, at National Institute of Hydrology as Scientist of NIH.
59. Design storm and design flood, August 10-14, 1987, at KERS, Mysore as Scientist of NIH.
60. Flood frequency analysis, Oct. 5-9, 1987, at Hyderabad, as Scientist of NIH.
61. Flood estimation using Unit Hydrograph Techniques, Feb. 8-12, 1988, at Lucknow.

National and International Conferences organized

1. Third National Dam Safety conference at IIT Roorkee in collaboration with Central Water Commission, and UJVNL February 18-19, 2017.
2. International Symposium on ‘Hydrological Perspectives for Sustainable Development’ at IIT Roorkee, Feb. 23-25, 2005, as member of core organizing committee.
3. International Symposium on 'Emerging Trends in Hydrology' at IIT Roorkee, Sept. 25-27, 1997; as Joint Organizing Secretary.
4. National Seminar on 'Hydrological Hazards- Prevention and Mitigation', at IIT Roorkee, March 17- 18, 1993, as Organizing Secretary.

International exposure:

Sept 16-24, 2022	London, Centre of Ecology and Hydrology, Wallingford, UK
Sept. 11-15, 2022	IWA World Water Congress and Exhibition, Copenhagen, Denmark
Nov. 17-21, 2016	Wuhan, China; Three Gorges Dam
July 13-22, 2012	TUHH, Germany, WMO Geneva, Dubai
Sept. 23-25, 2011	Dhaka, Bangladesh, Institute of Water Modelling
June 2007	UNESCO-IHE, Delft
March- April, 2007	UNESCO- IHE Delft, WMO, Geneva, Switzerland
Sept. 2006	Nanjing, China, AIT, Bangkok
Oct. 2005	Norway, UNESCO-IHE Delft
June 2003 to July 2003	University of Waterloo, Canada
May 2001 to Aug. 2001	University of Waterloo, Canada
Dec. 1998 - March, 1999	University of Waterloo, Waterloo, Canada, Tufts University, Medford, MA, USA
Nov. 1987 - Dec. 1987	University College Galway, Ireland
Aug. 1983 - Jan. 1984	Colorado State University, Fort Collins, U.S.A., Also visited USGS, University of Texas, Purdue university, Harvard, MIT etc. across USA

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