

## BIO-DATA OF C. P. KUMAR

Name : **C. P. Kumar**

Affiliation : Former Scientist 'G'  
National Institute of Hydrology  
Jal Vigyan Bhawan  
Roorkee – 247667 (Uttarakhand)  
INDIA



Web Site : <http://www.angelfire.com/nh/cpkumar/>

Education : B.Sc.Engg.(Civil), 1983, AMU-Aligarh  
M.E.(Hydraulic Engg.), 1985, UOR-Roorkee

Professional IDs : ORCID ID - [orcid.org/0000-0003-0576-2779](http://orcid.org/0000-0003-0576-2779)  
ResearcherID - A-9994-2013

Google Scholar : <https://scholar.google.co.in/citations?user=Wp8-kHUAAAAJ&hl=en>

Work Experience : 35 Years (w.e.f. 17.4.1985)

*National Institute of Hydrology, Roorkee*

- S.R.A. - 17.04.1985 to 21.11.1985
- Scientist 'B' - 22.11.1985 to 18.08.1991
- Scientist 'C' - 19.08.1991 to 18.08.1997
- Scientist 'E1' - 19.08.1997 to 01.07.2009
- Scientist 'F' - 02.07.2009 to 30.06.2015
- Scientist 'G' - 01.07.2015 to 30.09.2020

### Research Areas of Interest

1. Assessment of Groundwater Potential
2. Sea Water Intrusion in Coastal Aquifers
3. Numerical Modelling of Unsaturated Flow, Groundwater Flow and Contaminant Transport
4. Management of Aquifer Recharge
5. Impact of Climate Change on Groundwater

Technical Reports : **38**

Technical Papers : **122**

Books Published : **8**

## Technical Studies

### (a) *Ground Water Assessment*

- Ground Water Balance of Upper Ganga Canal Command Area
- Ground Water Balance of Jamnagar District (Gujarat)
- Estimation of Irrigation Return Flow
- Impact of Rainwater Harvesting on Groundwater in Savna Watershed

### (b) *Modelling of Unsaturated Flow*

#### (i) Laboratory and Field Determination of Soil Moisture Characteristics

- RD 838 of Indira Gandhi Nahar Pariyojana, Stage-II
- Upper Part of Hindon River Catchment
- Malaprabha and Ghataprabha Basins
- Savna Watershed

#### (ii) Modelling of Soil Moisture Movement

- Development of a Numerical Simulation Model for One-Dimensional Infiltration
- Prediction of Evaporation Losses from Shallow Water Table
- Evaporation from Layered Soils in the Presence of a Water Table
- Estimation of Ground Water Recharge due to Rainfall
- Effect of Water Table Depth on Recharge due to Rainfall

### (c) *Modelling of Sea Water Intrusion*

Simulation of Sea Water Intrusion and Tidal Influence

- Nauru Island (Central Pacific Ocean)
- Ernakulam Coast
- Goa Coast
- Porbandar Coast (Minsar River Basin)

### (d) *Modelling of Ground Water Flow and Solute Transport*

- Common Ground Water Modelling Errors
- Modeling of Solute Transport in Agricultural Fields
- Simulation of Solute Transport in Saline Areas of Ghataprabha Command

### (e) *Application of Hydrological Models*

- Application of SHE Model to Narmada (upto Manot) Basin
- Application of SHE Model to Hemavati (upto Sakleshpur) Basin

- Simulation of Soil Moisture Movement in Barchi Watershed using SWIM Model

(f) *Impact of Climate Change*

- Impact of Climate Change on Groundwater
- Impact on Dynamic Groundwater System in Sonar Sub-basin

**Association in Sponsored and Consultancy Projects** : **8**

1. Hydrostatic Pressure Imbalance Study for Kayamkulam Gas Power Project, Kerala (sponsored by NTPC Limited, New Delhi)
2. Assessment of Impact of Irrigation Application in a part of IGNP Stage-II Command Area underlain by Hydrologic Barrier (sponsored by Command Area Development, IGNP, Bikaner)
3. Evaluating the Impact of Forest Rehabilitation Strategies (UNESCO Project)
4. Estimation of Irrigation Return Flow in Lokapavani Area in Krishnarajasagar Command (Hydrology Project)
5. Hydrological and Hydrogeological Investigations to Assess Causes of Seepage from the Reservoir of Jaswant Sagar Dam in Jodhpur (Water Resources Department, Rajasthan)
6. Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Hydrology Project - II)
7. Integrated Hydrological Investigations of Sukhna Lake, Chandigarh for its Conservation and Management (Forest Department, Chandigarh)
8. Groundwater Fluctuations and Conductivity Monitoring in Punjab – New Evidence of Groundwater Dynamics in Punjab from High Frequency Groundwater Level and Salinity Measurements (British Geological Survey)

**Books Written** : **8**

1. Book on “*Comprehensive Hydrological Studies of Narmada Basin - Summary of the Studies, Conclusions and Recommendations*” by Rakesh Kumar and C. P. Kumar, National Institute of Hydrology, Roorkee, 1999, 133 p.
2. eBook on "*Assessment of Groundwater Potential*", Scientific Essay by C. P. Kumar, ISBN: 978-3-656-75555-5, GRIN Publishing GmbH, Munich, Germany, 2014, 23 p.

3. eBook on "*Groundwater Data Requirement and Analysis*", Scientific Essay by C. P. Kumar, ISBN: 978-3-656-75554-8, GRIN Publishing GmbH, Munich, Germany, 2014, 27 p.
4. eBook on "*Impact of Climate Change on Groundwater Resources*", Academic Paper by C. P. Kumar, ISBN: 978-3-656-75551-7, GRIN Publishing GmbH, Munich, Germany, 2014, 33 p.
5. Book on "*Groundwater Assessment and Modelling*" (Paperback and Kindle Editions) by C. P. Kumar, ISBN: 978-1511520492, CreateSpace Independent Publishing Platform (An Amazon Company), USA, 2015, 332 p.
6. Book on "*Modelling of Sea Water Intrusion using SUTRA*" by C. P. Kumar, ISBN: 978-3-659-87389-8, LAMBERT Academic Publishing, Germany, 2017, 56 p.
7. Book on "*Water Resources Assessment, Modelling and Management*" (Paperback and Kindle Editions) by C. P. Kumar, ISBN: 979-8388583055, Kindle Direct Publishing (Amazon), 2023, 409 p.
8. Book on "*Hydrology and Water Resources: A Comprehensive Questions and Answers Guide*" (Paperback and Kindle Editions) by C. P. Kumar, ISBN: 979-8390104958, Kindle Direct Publishing (Amazon), 2023, 63 p.

**Book Chapters Written** : 7

1. Chapter on "*Ground Water Modelling*" by C. P. Kumar; In. *Hydrological Developments in India Since Independence*, A Contribution to Hydrological Sciences, National Institute of Hydrology, Roorkee, 1992, pp. 235-261.
2. Self-instructional Course Material on "*Surface Water and Ground Water Resources*" by C. P. Kumar and Rakesh Kumar; School of Engineering & Technology, Indira Gandhi National Open University (IGNOU).
3. Article on "*Groundwater Balance*" (GW-1518) by C. P. Kumar; In. *The Encyclopedia of Water*, John Wiley & Sons, Inc., New York, 2005, Volume 5, pp. 162–169.
4. Chapter on "*Groundwater Flow Models: An Overview*" by C. P. Kumar; In. *Groundwater Modelling and Management* (Eds. N. C. Ghosh & K. D. Sharma), Capital Publishing Company, New Delhi, 2006, pp. 153-178.
5. Chapter on "*Management of Groundwater in Salt Water Ingress Coastal Aquifers*" by C. P. Kumar; In. *Groundwater Modelling and Management* (Eds. N. C. Ghosh & K. D. Sharma), Capital Publishing Company, New Delhi, 2006, pp. 540-560.

6. Chapter on “*Impact of Climate Change on Groundwater Resources*” by C. P. Kumar; In. Handbook of Research on Climate Change Impact on Health and Environmental Sustainability (Editor: Soumyananda Dinda), A Volume in the Advances in Environmental Engineering and Green Technologies (AEEGT) Book Series, IGI Global, 2015, pp. 198-223.
7. Chapter on "*Climate Change and Groundwater*" by C. P. Kumar, Anupma Sharma, K. V. Sruthi, B. K. Purandara and Sumant Kumar; In. Climate Change and Its Impacts on Water Resources with Focus on India (Eds. Sharad K. Jain & P. K. Singh), Special Report-1/19, National Institute of Hydrology, Roorkee, India, July 2019, pp. 164-177.

**M.E./M.Tech. Dissertation Guided : 6**

1. *Prediction of One Dimensional Solute Movement in Unsaturated Medium*  
(Mr. Abdhesh Kumar Upadhyay, M.Tech., Applied Geophysics, 1995, University of Roorkee)
2. *Simulation of Sea Water Intrusion for Cochin Coast (Ernakulam District)*  
(Ms. Deepanjali D. Bhosale, M.Tech., Environmental Engineering, 1999-2000, K.L.E. Society's College of Engineering and Technology, Belgaum)
3. *Utilisation of Saturated-Unsaturated Transport (SUTRA) Model for Goa Coast*  
(Ms. Mayuree N. Natu, M.Tech., Environmental Engineering, 1999-2000, K.L.E. Society's College of Engineering and Technology, Belgaum)
4. *Modelling of Soil Moisture Movement and Solute Transport in an Agricultural Field using SWIM*  
(Ms. Shilpa S. Ratnoji, M.Tech., Environmental Engineering, 2000-2001, K.L.E. Society's College of Engineering and Technology, Belgaum)
5. *Isotopic Characterization of Groundwater in Lower Part of Sutlej Basin*  
(Mr. K. Sumanth Dutt, Geological Technology, 2014, Department of Earth Sciences, I.I.T. Roorkee)
6. *Soil Moisture Flow Modelling using HYDRUS 1D*  
(Mr. Vikrant, Karunya University, Coimbatore, 2016)

**Training Courses / Workshops Organized : 9**

1. Training Course on "*Software for Ground Water Data Management*" at NIH, Roorkee during the period 7-18 October, 1996.
2. Workshop on "*Modelling of Hydrologic Systems*" at Hard Rock Regional Centre, NIH, Belgaum during the period 4-8 September, 2000.
3. Workshop on "*Remote Sensing and GIS Applications in Hydrology*" at Hard Rock Regional Centre, NIH, Belgaum during the period 23-25 September, 2002.

4. Training course on “*Sustainable Ground Water Management in Arid and Semi-Arid Region*” at NIH, Roorkee during the period 23 April – 4 May, 2007.
5. Training Course on “*Coastal Groundwater Modeling & Management*” at WALMI, Anand (Gujarat) during the period 22-26 November, 2010.
6. Training Course on "*Hydrological Investigations for Conservation and Management of Lakes*" at NIH, Roorkee during the period 26-28 March 2012.
7. Training Course on "*Hydrological Investigation Techniques for Water Resource Development & Management*" at NIH, Roorkee during the period 27-30 August, 2012.
8. Training Course on “*Hydrological Investigations for Conservation and Management of Lakes*” at NIH, Roorkee during the period 15-18 January, 2013.
9. Training Course on “*Coastal Groundwater Development, Modeling & Management*” at Ahmedabad (Gujarat) during the period 3-7 March, 2014.

### **Editorial Board Member**

: 9

1. *American Journal of Water Resources*  
(Science and Education Publishing)  
<http://www.sciepub.com/journal/AJWR/editors>
2. *Advances in Engineering & Scientific Research*  
<http://advancejournals.org/advances-in-engineering-and-scientific-research/editor-board/>
3. *International Journal of Current Trends in Engineering & Research*  
<http://www.ijcter.com/editorial-board/>
4. *Earth Science India*  
<http://www.earthscienceindia.info/members.aspx>
5. *Current World Environment*  
<http://www.cwejournal.org/editorial-board/>
6. *Environmental Science: An Indian Journal*  
<https://www.tsijournals.com/journals/environmental-science-an-indian-journal-editors.html>
7. *Madridge Journal of Agriculture and Environmental Sciences*  
<https://madridge.org/journal-of-agriculture-and-environmental-sciences/editors>
8. *International Journal of BioSciences and Technology (IJBST)*  
<https://board.ijbst.org/>

9. *Central Asian Journal of Environmental Science and Technology Innovation*  
<http://www.cas-press.ru/journal/editorial.board>

**Awards** : 2

1. Mr. C. P. Kumar was awarded **The Certificate of Merit** for 1996-97 by The Institution of Engineers (India) for his paper entitled "*Prediction of Evaporation Losses from Shallow Water Table using a Numerical Model*".
2. Mr. C. P. Kumar and Mr. Manohar Arora were awarded **The Certificate of Merit** by The Institution of Engineers (India) for their paper entitled "*Modelling of Soil Moisture Movement*" published in the Journal of the Institution (Twenty-first day of December, 2000).

**Foreign Visits / Trainings Received** : 2

S.No.	Country	Period	Institute	Topic
1	Denmark	9 August to 8 December, 1989	Danish Hydraulic Institute, Horsholm	Hydrological Computerized Modelling System (SHE)
2	Australia	1 January to 30 April, 1998	National Tidal Facility, Adelaide	The Modelling of Salt Water Intrusion

**Other Technical and Administrative Tasks**

- Scientist-in-charge, Ground Water Laboratory
- Scientist-in-charge, Indian National Committee on Hydrology (INCOH)
- Assistant Engineer (Civil)
- Finance Officer
- Head, Hard Rock Regional Centre, Belgaum
- Officer-in-Charge, Communication & Telephones
- Officer-in-Charge, Computer Centre
- Head, Computer Centre
- Coordinator, Purpose Driven Studies (Hydrology Project, Phase – II)
- Chairman, Annual Report Committee
- Chairman, e-Governance Committee
- Head, Hydrological Investigations Division
- Coordinator, Hard Rock Regional Centre, Belgaum
- Nodal Officer, e-Governance
- Chief Editor, Jal Chetna (Technical Magazine)

- Coordinator, Purpose Driven Studies (National Hydrology Project)
- Member Secretary, Expert Committee for Purpose Driven Studies (NHP)
- Chairman, e-Governance Cell
- Coordinator, INCIHP (Indian National Committee for International Hydrological Programme of UNESCO)
- Member-Secretary, Achievements Review Committee
- Member Secretary, Sub-Committee on PDS (National Hydrology Project)
- Chairman, Standing Works and Services Committee
- Head, Ground Water Hydrology Division
- Chairman, External Project Management Cell

## Internet Hydrology

Creation and monitoring of the following websites and e-mail discussion groups:  
(*Yahoo! Groups discontinued from 15 December 2020*)

1. **Kumar Links to Hydrology Resources**  
<http://www.angelfire.com/nh/cpkumar/hydrology.html>
2. **Hydrology Forum**  
<http://groups.yahoo.com/group/hydforum/>
3. **Hydrological Modelling Discussion Group**  
<http://in.groups.yahoo.com/group/hydrologymodel/>
4. **Ground Water Modelling Discussion Group**  
<http://groups.yahoo.com/group/gwmodel/>

## Fellow/Member of Professional Associations : 10

- |     |  |   |               |
|-----|--|---|---------------|
| 1.  | The Institution of Engineers (India)                 | : | F-016636/3    |
| 2.  | Indian Association of Hydrologists                   | : | FM-191        |
| 3.  | Indian Water Resources Society                       | : | F-2001-1106   |
| 4.  | Association of Hydrologists of India                 | : | AHI-LM-51-333 |
| 5.  | The Indian Society for Hydraulics                    | : | F-19          |
| 6.  | Indian Society of Soil Science                       | : | LM/K/043      |
| 7.  | Indian Association of Soil & Water Conservationists: |   | LM-1177-K     |
| 8.  | Soil Conservation Society of India                   | : | LM-2152       |
| 9.  | Indian Society of Applied Geochemists                | : | LM-447        |
| 10. | Association of Global Groundwater Scientists         | : | LM-AGGS-063   |

## Technical Reports Published

1. **Kumar, C. P.** and P. V. Seethapathi (1987), "*Assessment of Recharge from Various Sources to an Aquifer and Assessment of Aquifer Yield*", Technical Report No. TR-18 (Secret/Restricted), 1986-87, National Institute of Hydrology, Roorkee.



2. **Kumar, C. P.** and P. V. Seethapathi (1988), "*Effect of Additional Surface Irrigation Supply on Ground Water Regime in Upper Ganga Canal Command Area, Part I - Ground Water Balance*", Case Study Report No. CS-10 (Secret/Restricted), 1987-88, National Institute of Hydrology, Roorkee.
3. **Kumar, C. P.** (1989), "*Estimation of Evapotranspiration*", Technical Note No. TN-45, 1988-89, National Institute of Hydrology, Roorkee.
4. **Kumar, C. P.** (1990), "*Application of SHE Model to Narmada (upto Manot) Basin*", Case Study Report No. CS-29, 1989-90, National Institute of Hydrology, Roorkee.
5. **Kumar, C. P.** (1991), "*Application of SHE Model to Hemavati (upto Sakleshpur) Basin*", Case Study Report No. CS-46, 1990-91, National Institute of Hydrology, Roorkee.
6. **Kumar, C. P.** and G. C. Mishra (1991), "*Development of a Soil Moisture Prediction Model*", Technical Report No. TR-104, 1990-91, National Institute of Hydrology, Roorkee.
7. **Kumar, C. P.** (1992), "*Prediction of Evaporation Losses from Shallow Water Table using a Numerical Model*", Technical Report No. TR-119, 1991-92, National Institute of Hydrology, Roorkee.
8. **Kumar, C. P.** (1993), "*Estimation of Ground Water Recharge due to Rainfall by Modelling of Soil Moisture Movement*", Technical Report No. TR-142, 1992-93, National Institute of Hydrology, Roorkee.
9. **Kumar, C. P.** (1994), "*Soil Moisture Simulation by Improved Numerical Method*", Technical Report No. TR(BR)-111, 1993-94, National Institute of Hydrology, Roorkee.
10. **Kumar, C. P.** (1995), "*Ground Water Balance before Introduction of Irrigation in the Canal Command Area*", Technical Report No. TR(BR)-119, 1994-95, National Institute of Hydrology, Roorkee.
11. **Kumar, C. P.** (1995), "*Effect of Water Table Depth on Recharge due to Rainfall*", Technical Report No. TR(BR)-120, 1994-95, National Institute of Hydrology, Roorkee.
12. Seethapathi, P. V., G. Ramaswamy, A. B. Palaniappan, **C. P. Kumar** and C. K. Jain (1995), "*Hydrological Studies for the Proposed Gas Based Power Project at Kayamkulam, Alleppey District, Kerala*", Sponsored by National Thermal Power Corporation Ltd., New Delhi, 76 p.

13. **Kumar, C. P.** (1996), "*Evaporation from Layered Soils in the Presence of a Water Table*", Technical Report No. TR(BR)-142, 1995-96, National Institute of Hydrology, Roorkee.
14. Mishra, G. C., **C. P. Kumar** and Vivekanand Singh (1997), "*Assessment of Irrigation Return Flow*", Technical Report No. TR(BR)-11/96-97, National Institute of Hydrology, Roorkee.
15. **Kumar, C. P.** (1997), "*The Problems associated with Deltas with emphasis on Salt Water Intrusion*", Status Report, UNDP Project (IND/90/003), National Institute of Hydrology, Roorkee.
16. **Kumar, C. P.** (1998), "*The Modelling of Salt Water Intrusion*", Training Report in the field of Deltaic Hydrology, UNDP Project (IND/90/003), National Institute of Hydrology, Roorkee.
17. Singh, Vivekanand, G. C. Mishra, Sudhir Kumar and **C. P. Kumar** (1998), "*Feasibility Study of Rainwater Harvesting in Semi-Arid Region*", Technical Report No. TR(BR)-6/97-98, National Institute of Hydrology, Roorkee.
18. Kumar, Rakesh and **C. P. Kumar** (1999), "*Comprehensive Hydrological Studies of Narmada Basin - Summary of the Studies, Conclusions and Recommendations*", National Institute of Hydrology, Roorkee, February 1999.
19. **Kumar, C. P.** (1999), "*Variation of Soil Moisture Characteristics in a Part of Hindon River Catchment*", Case Study Report No. CS(AR)4/98-99, 1998-99, National Institute of Hydrology, Roorkee.
20. Purandara, B. K., **C. P. Kumar**, B. Venkatesh and P. R. S. Rao (2000), "*Spatial Variation of Soil and Hydrological Characteristics of Selected Watersheds in Hard Rock Region*", Case Study Report No. CS/AR-5/1999-2000, National Institute of Hydrology, Roorkee.
21. **Kumar, C. P.** and B. K. Purandara (2001), "*Simulation of Soil Moisture Movement in a Hard Rock Watershed using SWIM Model*", Technical Report, 2000-2001, National Institute of Hydrology, Roorkee.
22. Jain, C. K., K. K. S. Bhatia, **C. P. Kumar** and B. K. Purandara (2001), "*Ground Water Quality in Malaprabha River Basin, Karnataka*", Technical Report, 2000-2001, National Institute of Hydrology, Roorkee.
23. Purandara, B. K., **C. P. Kumar**, B. Soni and N. Varadarajan (2002), "*Simulation of Solute Transport in Saline Areas of Ghataprabha Command*", Technical Report, 2001-2002, National Institute of Hydrology, Roorkee.
24. Jain, C. K., **C. P. Kumar** and M. K. Sharma (2002), "*Ground Water Quality in Ghataprabha Command Area, Karnataka*", Technical Report, 2001-2002, National Institute of Hydrology, Roorkee.

25. Mishra, G. C., S. K. Singh, **C. P. Kumar**, Sudhir Kumar and M. K. Shukla (2003), "*Final Report on Assessment of Impact of Irrigation Application in a Part of IGNP Stage-II Command Area underlain by Hydrologic Barrier*", Sponsored by Command Area Development, Indira Gandhi Nahar Pariyojana, Bikaner, 225 p.
26. Ghosh, N. C., B. Venkatesh, Sudhir Kumar, **C. P. Kumar**, A. V. Shetty and B. K. Purandara (2003), "*Surface and Subsurface Data Compilation, Analyses and Lumped Water Balance of the Lokapavani Area in Krishnaraja Sagar Command*", Part I of R & D Project – Estimation of Irrigation Return Flow in Lokapavani Area of Krishnaraja Sagar Command, Karnataka.
27. Vivekanand Singh, N. C. Ghosh, Sudhir Kumar, **C. P. Kumar**, A. V. Shetty and B. K. Purandara (2003), "*Estimation of Irrigation Return Flow using Process Level Modelling*", Part II of R & D Project – Estimation of Irrigation Return Flow in Lokapavani Area of Krishnaraja Sagar Command, Karnataka.
28. Rathore, D. S., N. C. Ghosh, Sudhir Kumar, **C. P. Kumar**, A. V. Shetty and B. K. Purandara (2003), "*Distributed Modeling of the Hydrologic Systems of the Lokapavani Area in Krishnaraja Sagar Irrigation Command using MIKE SHE WM MODULE*", Part III of R & D Project – Estimation of Irrigation Return Flow in Lokapavani Area of Krishnaraja Sagar Command, Karnataka.
29. Jain, S. K., Anupma Sharma, Rakesh Kumar and **C. P. Kumar** (2003), "*The Global and Indian Freshwater Crisis: A Perspective*", National Institute of Hydrology, Roorkee.
30. **Kumar, C. P.**, A. G. Chachadi, B. K. Purandara, Sudhir Kumar, N. Varadarajan and Raju Juyal (2007), "*Modelling of a Coastal Aquifer using FEFLOW*", Report No. TR/BR-1/2006-07, National Institute of Hydrology, Roorkee, 36 p.
31. Singh, Surjeet, **C. P. Kumar**, Anupma Sharma and Rajan Vatsa (2012), "*Impact of Climate Change on Dynamic Groundwater System in a Drought Prone Area*", National Institute of Hydrology, Roorkee.
32. Sharma, Anupma, **C. P. Kumar**, C. K. Jain, Sudhir Kumar, D. S. Rathore, M. S. Rao, Surjeet Singh, Rajan Vatsa (2014), "*Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat*", Purpose Driven Study, Hydrology Project – II, National Institute of Hydrology, Roorkee, 122 p.
33. **Kumar, C. P.**, B. K. Purandara and P. R. Rao (2014), "*Simulation of Soil Moisture Movement in a Hard Rock Watershed using SWIM Model*", Technical Report, ISBN (eBook): 978-3-656-76884-5, ISBN (Book): 978-3-656-76883-8, GRIN Publishing GmbH, Munich, Germany, 79 p.

34. Kumar, Sumant, N. C. Ghosh, **C. P. Kumar**, Surjeet Singh, R. P. Singh, Sanjay Mittal (2015), "*Managed Aquifer Recharge (MAR) and Aquifer Storage Recovery (ASR)*", National Institute of Hydrology, Roorkee, 92 p.
35. Rao, M. S., Gopal Krishan, **C. P. Kumar** and Sudhir Kumar (2016), "*The Use of Environmental Isotopes to assess Sustainability of Intensively Exploited Aquifer Systems in North Eastern Parts of Punjab, India*", National Institute of Hydrology, Roorkee.
36. Ghosh, N. C., **C. P. Kumar**, Anupma Sharma, Surjeet Singh and M. K. Jose (2016), "*Status Document on Subsurface Water Modelling – Flow and Contaminant Transport*", Centre for Excellence for Hydrological Modelling, National Hydrology Project, National Institute of Hydrology, Roorkee, 54 p.
37. Krishan, Gopal, **C. P. Kumar**, Purnaba Dasgupta and Andrew Mackenzie (2019), "*Improving Our Understanding of the Aquifer Systems in Sunderbans*", Report of Pump Priming Project, India-UK Water Centre, December 2019, 34 p.
38. Singh, Surjeet, **C. P. Kumar**, Gopal Krishan, Ravi V. Galkate, Sumant Kumar, Suman Gurjar, S. L. Srivastava, Anju Chaudhary, Sanjay K. Mittal, Survey Daman Sharma, Pinki Sharma (2020), "*Hydro-geological Study of Goindwal Sahib Area of Tarn Taran District, Punjab*", Sponsored by GVK Power (Goindwal Sahib) Limited, Punjab, Final Report by National Institute of Hydrology, Roorkee, March 2020.

## Technical Papers Published

### (a) National and International Journals

1. **Kumar, C. P.** and S. K. Pathak (1987), "*Triangular Side Weirs*", Journal of Irrigation and Drainage Engineering, American Society of Civil Engineers, Vol. 113, No. 1, February 1987, pp. 98-105.
2. Mishra, G. C. and **C. P. Kumar** (1991), "*Hydrological Forecast of Soil Moisture*", Jalvigyan Sameeksha (Hydrology Review), A Publication of Indian National Committee on Hydrology, Volume V, Number 1 & 2, June 1991, pp. 79-84.
3. **Kumar, C. P.** (1991), "*Application of SHE Model to Hemavati (upto Sakleshpur) Basin*", Hydrology Journal, Indian Association of Hydrologists, Roorkee, Vol. XIV, No. 4, October-December 1991, pp. 209-227.
4. **Kumar, C. P.** (1992), "*Ground Water Modelling*", In. Hydrological Developments in India Since Independence", A Contribution to Hydrological Sciences, National Institute of Hydrology, Roorkee, pp. 235-261.

5. **Kumar, C. P.** (1994), "*Review of Analytical Procedures of Unsaturated Flow*", Hydrology Journal, Indian Association of Hydrologists, Roorkee, Vol. XVII, No. 3 & 4, July-December 1994, pp. 59-71.
6. **Kumar, C. P.** (1995), "*Physically - Based Distributed Modelling of Narmada (upto Manot) Basin using the Systeme Hydrologique Europeen*", Journal of Indian Water Resources Society, Volume I, Number 2, 3 & 4, June, July & Oct. 1995, pp. 11-16.
7. **Kumar, C. P.** (1996), "*Developments in Ground Water Hydrology : An Overview*", SATI Journal of Science and Technology, Sati Vigyan and Takniki Parishad (Samrat Ashok Technological Institute), Vidisha, Volume 1, No. 1, January 1996, pp. 80-92.
8. **Kumar, C. P.** (1996), "*Prediction of Evaporation Losses from Shallow Water Table using a Numerical Model*", Journal of The Institution of Engineers (India), Civil Engineering Division, Volume 77, August 1996, pp. 103-107.
9. Mittal, Sanjay and **Chandra Prakash Kumar** (1996), "*Bhu-Jal Santulan*", Bhagirath Journal (Hindi), April-September 1996, pp. 19-24.
10. **Kumar, C. P.** (1996), "*Development of a Soil Moisture Prediction Model*", Journal of Applied Hydrology, Association of Hydrologists of India, Vol. IX, No. 3 & 4, July & Oct. 1996, pp. 1-15.
11. **Kumar, Chandra Prakash** and Neeraj Kumar Bhatnagar (1996), "*Uthle Bhu-Jal Star Se Vashpan - Ek Punarvalokan*", Bhagirath Journal (Hindi), October-December 1996, pp. 16-18.
12. **Kumar, C. P.** (1997), "*Estimation of Natural Ground Water Recharge*", ISH Journal of Hydraulic Engineering, Volume 3, No. 1, March 1997, pp. 61-74.
13. **Kumar, C. P.** (1997), "*Effect of Water Table Depth on Recharge due to Rainfall*", Journal of Indian Water Resources Society, Volume 17 (3), Number 2, April 1997, pp. 13-19.
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