

Progress Reports of C. P. Kumar

Brief Resume of Tasks by C. P. Kumar, Scientist 'G' National Institute of Hydrology, Roorkee – 247667 (Uttarakhand), India

Year 2019-2020

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the following studies and sponsored projects:
 - Application of Satellite Data Products for Water Resources Assessment (May 2019 - April 2021)
 - The Regional Hydrological Impact of Farm-Scale Water Saving Measures in the Gangetic Plains (CSIRO) (August 2019 - July 2020)
 - Study of River - Aquifer Interactions and Groundwater Potential at Selected Sites in the Upper Ganga Basin up to Dabrani (NMSHE) (January 2016 - December 2020)
 - Groundwater Fluctuations and Conductivity Monitoring in Punjab - New Evidence of Groundwater Dynamics in Punjab from High Frequency Groundwater Level and Salinity Measurements (BGS) (December 2017 - November 2020)
 - Assessment of Impacts of Groundwater Salinity on Regional Groundwater Resources, Current and Future Situation in Mewat, Haryana – Possible Remedy and Resilience Building Measures (PDS) (December 2017 - November 2021)
 - Ganges Aquifer Management in the Context of Monsoon Runoff Conservation for Sustainable River Ecosystem Services - A Pilot Study (PDS) (December 2017 - November 2021)
 - Improving our Understanding of the Aquifer Systems in Sunderbans (India-UK Water Centre) (June 2019 - November 2019)
2. Prepared a note on “*Rain Water Harvesting*” required as a backgrounder brief for Niti Aayog.
3. Prepared comments on Rann Sarovar proposal submitted by Ajanta-OREVA Group to Ministry of Jal Shakti.
4. Studied the WALTA Act, 2002 (Andhra Pradesh Water, Land and Trees Act, 2002) and prepared comments on the letter from Mr. H. R. Kameswara Rao regarding distance to be maintained between bore wells.

5. Examined the draft report on *Groundwater Extraction Guidelines* in compliance of the NGT directions and prepared comments.
6. Examined the draft report on “*Detection of Arsenic Contamination in Groundwater of Laksar Area, Haridwar District, Uttarakhand*” (Sumant Kumar).
7. Review of 9 technical papers for the following Journals –
 - Journal of the Geological Society of India
 - Current World Environment
 - IWRS Journal
 - Euro-Mediterranean Journal for Environmental Integration
 - Annals of Ayurvedic Medicine
 - Groundwater for Sustainable Development (Elsevier)
 - Current Trends in Forest Research
 - Journal of Hydrology
 - Journal of the Geological Society of India.

[B] TECHNICAL REPORTS

1. 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.
2. 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.

[C] TECHNICAL PAPERS

1. **Kumar, C. P.** (2019), "*Purpose Driven Studies Under National Hydrology Project, India*", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), ISSN (Print): 2395-1990, ISSN (Online): 2394-4099, Volume 6, Issue 5, September-October 2019, pp. 213-229. <https://doi.org/10.32628/IJSRSET1196522>
2. **Kumar, C. P.** (2020), "*An Overview of Hydrological Studies by C. P. Kumar*", International Journal of Advanced Engineering Research and Science (IJAERS), ISSN (Print): 2349-6495, ISSN (Online): 2456-1908, Volume 7, Issue 3, March 2020, pp. 322-337. <https://dx.doi.org/10.22161/ijaers.73.48>
3. Krishan, Gopal, **C. P. Kumar**, Gokul Prasad, M. L. Kansal, Brijesh Kumar Yadav, Surjeet Singh, Lalit Mohan Sharma and Mamta Bisht (2019), "*Inland Groundwater Salinity and it's Movement towards Fresh Water Aquifers - Indicators of Saline Water Intrusion for the Mewat, Haryana*", In: Proceedings of 2nd International Conference on Sustainable Water Management, 6-8 November 2019, Pune, India.

4. Krishan, Gopal, **C. P. Kumar**, Suman Gurjar, B. S. Sidhu, Gokul Prasad, Anju Chaudhary and Rajesh Vasisth (2019), “पंजाब में जलभृत लवणता की समस्या”, In: Proceedings of 6वीं राष्ट्रीय जल संगोष्ठी, 16-17 December 2019 at National Institute of Hydrology, Roorkee, India.
5. Krishan, Gopal, **C. P. Kumar**, Gokul Prasad, M. L. Kansal, Brijesh Kumar Yadav and S. K. Verma (2020), “*Stable Isotopes and Inland Salinity - Evidences for Mixing and Exchange*”, Roorkee Water Conclave 2020, 26-28 February 2020, Roorkee, India.
6. Bisht, Mamta, Gopal Krishan, **C. P. Kumar**, Gokul Prasad and Surjeet Singh (2019), “*Evaluation of Groundwater Quality for Irrigation Purposes at Mewat, Haryana, India*”, In: Proceedings of 8th International Groundwater Conference on Sustainable Management of Soil-Water Resources, 21-24 October 2019, Roorkee, India.
7. Krishan, Gopal, M. S. Rao, **C. P. Kumar**, S. K. Verma, Vishal Gupta, Gokul Prasad, Vipin Agarwal, Raju Juyal, S. L. Srivastava, B. S. Sidhu, Rajesh Vasisth (2019), “*Application of Environmental Isotopes in Groundwater Salinity Studies*”, In: Proceedings of 8th International Groundwater Conference on Sustainable Management of Soil-Water Resources, 21-24 October 2019, Roorkee, India.
8. Mittal, Sanjay, Gopal Krishan and **C. P. Kumar** (2019), “*भारत में हरियाणा राज्य के मेवात जिले में मृदा प्रदूषण के सम्बंध में भारी धातुओं का आकलन*”, In: Proceedings of 6वीं राष्ट्रीय जल संगोष्ठी, 16-17 December 2019 at National Institute of Hydrology, Roorkee, India.

[D] BOOK CHAPTER

- **Kumar, C. P.**, Anupma Sharma, K. V. Sruthi, B. K. Purandara and Sumant Kumar (2019), “*Climate Change and Groundwater*”, 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.

[E] NATIONAL HYDROLOGY PROJECT (NHP)

1. **Coordinator, Purpose Driven Studies (PDS) till 31.12.2019**
 - Coordination of various activities pertaining to PDS proposals received from Implementing Agencies of National Hydrology Project.
 - Processing of PDS proposals for review, revision and presentation.
 - Compiling and updating the status of PDS proposals.
 - Conducted (as Member Secretary, Sub-Committee on PDS) the Sixth R&D Session on PDS during 8-9 August, 2019 at NIH, Roorkee and undertaken follow-up actions.
2. **NHP Meetings**

- Attended the 1st meeting of re-constituted Hydrological Information System Management Group (HISMG) on 3.6.2019 at Central Water Commission, New Delhi.
 - Attended the “*Modellers Meet*” during 6-7 December 2019 at New Delhi.
3. Prepared comments on the draft document “*Groundwater and Water Quality Modelling Framework*” (Peter Ravenscroft, TAMC).

[F] TRANSFER OF TECHNOLOGY

S. No.	Training Course	Lecture Delivered
1.	Orientation Training Course for newly appointed Scientists in NIH, organized by NIH at Roorkee during 27-28 May, 2019	<ul style="list-style-type: none"> ▪ An Overview of NIH Activities
2.	Training Course on ‘Groundwater Issues of Punjab with Special Emphasis on Groundwater Salinity’ conducted by NIH at Mohali during 16-18 July, 2019 (under National Hydrology Project)	<ul style="list-style-type: none"> ▪ Assessment of Groundwater Potential ▪ Groundwater Data Requirement and Analysis ▪ Tutorial on Groundwater Balance

[G] HEAD, GROUND WATER HYDROLOGY DIVISION

- Coordinated technical and administrative activities of Ground Water Hydrology division.
- Compilation of time allocation for various projects / Scientists of Ground Water Hydrology division.
- Prepared a format for monitoring the progress of major sponsored projects.
- Compiled achievements of Ground Water Hydrology division during last 5 years (2014-2019).
- Compiled state-wise list of major projects under progress in Ground Water Hydrology division.
- Compiled the updated roles and responsibilities for Ground Water Hydrology division and got conducted the ISO 9001: 2015 internal audit for Ground Water Hydrology division on 28.8.2019.

[H] EXTERNAL PROJECT MANAGEMENT CELL

- Follow-up actions related to Chairman, External Project Management Cell (from 3.1.2020).
- Conducted (as Chairman) the meetings of External Project Management Cell on 2.1.2020 and 4.3.2020.

[I] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	Standing Works and Services Committee	8.4.2019, 5.8.2019, 20.8.2019, 30.8.2019, 4.12.2019, 19.12.2019, 2.1.2020, 19.3.2020
2.	Chairman	House Allotment Committee for NIH Staff Colony	3.7.2019, 23.8.2019, 26.11.2019, 11.3.2020

[J] SPECIAL PURPOSE COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Member	To examine and suggest the disciplines for issuing advertisement to the posts – Scientist F(1), D(1), C(3), B(1)	12.4.2019
2.	Chairman	To evaluate the technical bids received for the purchase of ‘Triple Quadrupole Gas Chromatograph – Mass Spectrometer’	16.4.2019 29.4.2019 15.5.2019
3.	Chairman	To formulate policy for providing computers, printers etc.	25.4.2019 6.5.2019
4.	Chairman	To evaluate the technical bids received for the purchase of Ion Chromatograph (IC)	17.5.2019
5.	Chairman	To consider the revision of emoluments of existing project staff for two specific projects	17.6.2019
6.	Chairman	To discuss the complaint and financial bid for the purchase of ‘Triple Quadrupole Gas Chromatograph – Mass Spectrometer’	17.6.2019 1.7.2019 22.7.2019
7.	Chairman	Evaluation Committee for recommendation of awards for work in Hindi	25.7.2019 1.8.2019
8.	Chairman	Settlement of some issues in T&P items in Computer Centre	15.11.2019
9.	Chairman	Specifications for procurement of Imaging System (earth resistivity meter for groundwater exploration)	7.1.2020

[K] MEETINGS ATTENDED

S. No.	Group/Committee/Body	Dates	Place
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1.	3 rd meeting of Central Level Expert Group for overall re-assessment of groundwater resources of the country (as on 31 March 2017)	23.4.2019	CGWA, New Delhi
2.	48 th meeting of Working Group of NIH	2-3 May, 2019	NIH, Roorkee
3.	4 th FAR GANGA Project Management Board meeting and workshop	14.11.2019	NIH, Roorkee
4.	73 rd meeting of Technical Advisory Committee (TAC)	17.12.2019	NIH, Roorkee

[L] EDITORIAL BOARD MEMBER

➤ Working as Editorial Board Member for the following Journals.

1. *American Journal of Water Resources*
<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>

[M] MISCELLANEOUS

1. Evaluated the Hindi essays on the topic “भूजल स्तर के सुधार में जलविभाजक प्रबंधन की भूमिका” (technical category) for Essay Competition organized during ‘Hindi Month 2019’.

2. Prepared actionable points on the report of Achievements Review Committee (ARC).
3. Conducted (as Chairman) the technical session on “भूजल निर्धारण एवं प्रबंधन एवं झरना पुनरुद्धार” on 16.12.2019 during 6th राष्ट्रीय जल संगोष्ठी on ‘जल संसाधन एवं पर्यावरण’ at NIH, Roorkee.
4. Moderated the following electronic discussion groups on Yahoo!
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)

Year 2018-2019

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the following sponsored projects:
 - Groundwater Fluctuations and Conductivity Monitoring in Punjab – New Evidence of Groundwater Dynamics in Punjab from High Frequency Groundwater Level and Salinity Measurements (BGS) (December 2017 – November 2020)
 - Assessment of Impacts of Groundwater Salinity on Regional Groundwater Resources, Current and Future Situation in Mewat, Haryana – Possible Remedy and Resilience Building Measures (PDS) (December 2017 – November 2021)
 - Ganges Aquifer Management in the Context of Monsoon Runoff Conservation for Sustainable River Ecosystem Services – A Pilot Study (PDS) (December 2017 – November 2021)
2. Prepared “*Chapter 8: Climate Change and Groundwater*” (C. P. Kumar, Anupma Sharma, B. K. Purandara and Sumant Kumar) for the proposed NIH report on ‘Climate Change and its Impact on Water Resources’.
3. Follow-up action related to the project proposal entitled “*Demonstrating Operational Feasibility of Innovations in Transferring Flood/Excess Water to the Stressed Aquifer in the Ganges Basin: From Flood to Aquifer using UTFP*” (in partnership with IWMI-India and Central Soil Salinity Research Institute) submitted to National Water Mission (NWM) on 21.2.2018 for financial support.
4. Prepared comments on IPCC Special Report on Climate Change and Land (referring to groundwater and seawater intrusion parts).
5. Review of 9 technical papers for the following Journals –

- American Journal of Water Resources (2)
- Earth Systems and Environment
- Pedosphere Journal
- Current Science Journal (2)
- ISH Journal of Hydraulic Engineering
- Applied Ecology and Environmental Sciences Journal
- Environmental Monitoring and Assessment Journal

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2018), "*Water Resources Issues and Management in India*", Journal of Scientific and Engineering Research, ISSN: 2394-2630, Volume 5, Issue 9, pp. 137-147.
2. Kumar, C. P. (2018), "*Modelling Water Flow in Unsaturated Zone*", Review of Research Journal, ISSN: 2249-894X, Volume 8, Issue 2, November 2018, pp. 1-8.
3. Kumar, C. P., Gopal Krishan and S. K. Verma (2019), "*Norms for Groundwater Resource Estimation in India*", International Journal of Engineering Technologies and Management Research (IJETMR), ISSN: 2454-1907, Volume 6, Issue 1, January 2019, pp. 17-31. <http://doi.org/10.5281/zenodo.2551610>
4. Kumar, C. P. (2019), "*An Overview of Commonly Used Groundwater Modelling Software*", International Journal of Advanced Research in Science, Engineering and Technology, ISSN: 2350-0328, Volume 6, Issue 1, January 2019, pp. 7854-7865.

[C] NATIONAL HYDROLOGY PROJECT (NHP)

1. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to PDS proposals received from Implementing Agencies of National Hydrology Project.
- Processing of PDS proposals for review, revision and presentation.
- Compiling and updating the status of PDS proposals.
- Conducted (as Member Secretary, Sub-Committee on PDS) the Fourth R&D Session on PDS during 17-18 July 2018 at NIH, Roorkee and undertaken follow-up actions.
- Obtaining and processing half-yearly progress reports of approved PDS.
- Examined the online PDS module (MIS) and user help document and communicated the observations to TAMC/NPMU.
- Visited NPMU, New Delhi on 29.11.2018 and discussed the online PDS module (MIS) with officers of NPMU and TAMC. Suggestions were made to improve the module.
- Conducted (as Member Secretary, Sub-Committee on PDS) the Fifth R&D Session on PDS during 16-17 January, 2019 at NIH, Roorkee and undertaken follow-up actions.

2. Nodal Officer

- Worked as Nodal Officer, NHP during the period from 4 June 2018 to 3 July 2018.

3. Centre of Excellence for Hydrologic Modelling

- Attended the Brainstorming Workshop on “*Development of Integrated Hydrologic Model*” (conducted by IIT-Kharagpur and NIH-Roorkee under Centre of Excellence) on 1.11.2018.

4. World Bank Mission

- Attended the Phase-I of Second World Bank Review Mission (NHP) during 25-27 April, 2018 at Gangtok (Sikkim).
- Attended the Phase-III of Second World Bank Review Mission (NHP) on 6 June, 2018 at New Delhi.
- Attended the Phase-II of Third World Bank Review Mission (NHP) during 19-20 February, 2019 at Dehradun (Uttarakhand).

5. Hydrological Information System Management Technical Group (HISMG-Technical)

- Attended the second meeting of HISMG-Technical on 30.7.2018 at Central Water Commission, New Delhi.

6. Miscellaneous

- Prepared a proposal to conduct a meeting on GRACE applications for NHP Implementing Agencies.

[D] TRANSFER OF TECHNOLOGY

S. No.	Training Course	Lecture Delivered
1.	Training Course on ‘ <i>Hydrology, Water Resources Management and Climate Change</i> ’ (for Pacific Island Countries) organized by NIH at Roorkee during 25 June - 20 July, 2018	<ul style="list-style-type: none"> ▪ Planning and Management of Surface Water and Groundwater Interaction and Integration ▪ Case Studies on Groundwater in Different Environment
2.	Training Course on ‘ <i>Environmental Isotopes for Climate Resiliency of Mountain Watersheds</i> ’ (for participants from Nepal) organized by NIH at Roorkee during 22-26 October, 2018	<ul style="list-style-type: none"> ▪ Climate Change and its Possible Impact on Groundwater with Special Reference to Springs

3.	Training Course on ' <i>Coastal Zone Water Resources: Challenges, Investigation Techniques and Management</i> ' organized by NIH at Roorkee during 11-15 February, 2019 under NHP	<ul style="list-style-type: none"> ▪ Assessment of Groundwater Potential
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[E] ACHIEVEMENTS REVIEW COMMITTEE (ARC)

- Worked as Member-Secretary, Achievements Review Committee.
- Conducted (as Member-Secretary) the following meetings, prepared highlights and undertaken other follow-up actions:
 - Fourth Meeting of ARC on 4.4.2018 at Central India Hydrology Regional Centre (NIH), Bhopal.
 - Fifth Meeting of ARC on 11.7.2018 at ICID, New Delhi.
- Prepared the draft of following chapters for ARC report.
 - Chapter 1: Introduction
 - Chapter 2: National Institute of Hydrology (NIH) at a Glance
 - Chapter 6: Identification and Assessment of Factors which Facilitated or Impeded the Achievements of the Objectives
 - Chapter 7: Areas of Studies and Research to be Undertaken by the Institute in Coming 10 to 15 years
- Visited ICID, New Delhi on 26.7.2018 and discussed with Mr. A. B. Pandya (ARC Member) regarding draft report of ARC.
- Edited and finalized the complete ARC report incorporating the suggestions of Director (NIH) and ARC Members.
- Prepared a PowerPoint presentation on the ARC report.

[F] E-GOVERNANCE ACTIVITIES

- Follow-up actions related to Chairman, e-Governance Cell.
- Compiled the information related to e-Governance for Annual Report of NIH for the year 2017-18.

[G] JAL CHETNA

- Worked as Chief Editor for जल चेतना (Technical Magazine of NIH) till 25 March, 2019.
- Compiled (alphabetically arranged in groups of 50 each) the e-mail addresses collected by ALIO, NIH Library.

[H] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	House Allotment Committee for NIH Staff Colony	6.4.2018, 13.6.2018, 27.6.2018, 24.8.2018, 7.9.2018, 4.10.2018
2.	Member	राजभाषा कार्यान्वयन समिति	29.6.2018, 24.9.2018, 6.12.2018

[I] SPECIAL PURPOSE COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	DPC for the post of Technician, Gr. II	22.6.2018
2.	Member	Walk-in-interview on for selection of various project staff under ' <i>Neeranchal National Watershed Project</i> '.	10.7.2018
3.	Member	Walk-in-interview for selection of various project staff under NHP, PDS, NMSHE, SERB, SusHi-Wat projects	20.8.2018
4.	Member	Walk-in-interview for selection of Research Scientist – C under NMSHE project	21.8.2018
5.	Chairman	Investigation and proposed action to write off the missing items amounting to Rs. 7,255 during the course of physical verification for the period of 1.4.2000 to 31.3.2001	20.9.2018
6.	Member	To assess the requirement of furniture for renovated Water Quality Laboratory	31.10.2018
7.	Chairman	Physical Verification Committee for ICP-OES (Inductively Coupled Plasma Optical Emission Spectrometer)	13.2.2019

[J] MEETINGS ATTENDED

S. No.	Group/Committee/Body	Dates	Place
1.	47 th meeting of Working Group of NIH	23-24 October, 2018	NIH, Roorkee

[K] EDITORIAL BOARD MEMBER

➤ Working as Editorial Board Member for the following Journals.

- American Journal of Water Resources
<http://www.sciepub.com/journal/AJWR/editors>
- 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>

[L] MISCELLANEOUS

1. Looked after the routine duties of Head, Ground Water Hydrology division and Coordinator, Bhopal Regional Centre during the periods 30 June - 8 July 2018, 13-20 October 2018 and 14-18 January 2019.
2. Evaluated the Hindi essays on the topic “देश के समग्र विकास मे जल संसाधन प्रबंधन की भूमिका” (technical category) for Essay Competition organized during ‘Hindi Month 2018’.
3. Checked 20 abstracts for Coffee Table Book prepared on the occasion of 40th Anniversary of Foundation Day of NIH.
4. Attended the Brain Storming Session on “*Perspectives on Water Management in India and Future Directions*” on 15.12.2018 on the occasion of 40th Anniversary of Foundation Day of NIH.
5. Checked the draft of “*Chapter 5 – Sponsored & Consultancy Projects*” for Annual Report of NIH for the year 2017-18.
6. Moderated the following electronic discussion groups on Yahoo!
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)

Year 2017-2018

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the following technical studies and projects:
 - Peya Jal Suraksha - Development of Six Pilot Riverbank Filtration Demonstrating Schemes in Different Hydrogeological Settings for Sustainable Drinking Water Supply (November 2015 – April 2018)
 - Groundwater Fluctuations and Conductivity Monitoring in Punjab (BGS) (April 2017 – March 2020)
 - Assessment of Impacts of Groundwater Salinity on Regional Groundwater Resources, Current and Future Situation in Mewat, Haryana – Possible Remedy and Resilience Building Measures (PDS) (December 2017 – November 2020)
 - Ganges Aquifer Management in the Context of Monsoon Runoff Conservation for Sustainable River Ecosystem Services – A Pilot Study (PDS) (December 2017 – November 2021)
2. Submitted the project proposal entitled “*Demonstrating Operational Feasibility of Innovations in Transferring Flood/Excess Water to the Stressed Aquifer in the Ganges Basin: From Flood to Aquifer using UTFP*” (in partnership with IWMI-India and Central Soil Salinity Research Institute) to National Water Mission (NWM) for financial support.
3. Reviewed the Indo-US Bilateral Workshop Proposal on "*Coastal Groundwater Dynamics combining Future Climate Change and Human Development*" (WS-61-2017) under Indo-US Science and Technology Forum (IUSSTF).
4. Review of 13 technical papers for the following Journals –
 - American Journal of Mining and Metallurgy
 - Journal of Ecosystem & Ecography
 - ISH Journal of Hydraulic Engineering
 - Current World Environment Journal (4)
 - Journal of Earth Science & Climatic Change
 - World Journal of Environmental Engineering
 - Journal of the Geological Society of India
 - American Journal of Water Resources
 - Pedosphere Journal
 - International Journal of Hydrology Science and Technology

[B] TECHNICAL PAPERS PUBLISHED

1. **Kumar, C. P.** (2017), "*Hydrological Research at National Institute of Hydrology, India*", World Journal of Research and Review (WJRR), ISSN: 2455-3956, Volume 5, Issue 3, September 2017, pp. 21-27.

2. **Kumar, C. P.** (2018), "*Water Security – Challenges and Needs*", International Educational Scientific Research Journal (IESRJ), ISSN: 2455-295X, Volume 4, Issue 1, January 2018, pp. 26-29.
3. Krishan, Gopal, M. S. Rao, **C. P. Kumar**, Sudhir Kumar, R. S. Loyal, G. S. Gill and Prabhat Semwal (2017), "*Assessment of Salinity and Fluoride in Groundwater of Semi-Arid Region of Punjab, India*", Current World Environment, Volume 12, Issue 1, pp. 34-41.
4. Krishan, Gopal, Surjeet Singh, Anupma Sharma, Cornelius Sandhu, Sumant Kumar, **C. P. Kumar**, Suman Gurjar (2017), "*Assessment of River Yamuna and Groundwater Interaction using Isotopes in Agra and Mathura Area of Uttar Pradesh, India*", International Journal of Hydrology, Volume 1, Issue 3, pp. 86-89.
5. Krishan, Gopal, Brijesh Kumar Yadav, Lalit Mohan Sharma, **C. P. Kumar**, Surjeet Singh and A. Das (2017), "*Groundwater Conditions in Mewat, Haryana*", In: Proceedings of International Conference, 5th India Water Week 2017 - Water and Energy for Inclusive Growth, 10-14 October 2017, New Delhi, India.
6. Sharma, Anupma, Parul Gupta, N. C. Ghosh, **C. P. Kumar**, Vikrant Vijay Singh (2017), "*Freshwater-Saltwater Mixing in the Groundwater System of Minsar River Basin*", 7th International Groundwater Conference on 'Groundwater Vision 2030 - Water Security, Challenges & Climate Change Adaptation' (IGWC 2017), 11-13 December 2017, New Delhi, India.

[C] TECHNICAL BOOK

- The technical book "*Modelling of Sea Water Intrusion using SUTRA*" (C. P. Kumar) was published by LAMBERT Academic Publishing, Germany.

ISBN-13 : 978-3-659-87389-8
 ISBN-10 : 3659873896
 Number of pages : 56
 Published on : 02 June 2017

[D] BOOK CHAPTER

- Submitted the chapter on "*Impact of Climate Change on Groundwater System*" for the proposed book titled 'Ground Water Development - Issues and Sustainable Solutions' to be published by Springer.

[E] NATIONAL HYDROLOGY PROJECT (NHP)

1. Centre of Excellence for Hydrologic Modelling

- Edited the status document "*Subsurface Water Modelling – Flow and Contaminant Transport*" (prepared by N. C. Ghosh, C. P. Kumar, Anupma Sharma, Surjeet Singh, M. K. Jose).

2. Coordinator, Purpose Driven Studies (PDS)

- Inviting PDS proposals from Implementing Agencies of NHP.
- Coordination of various activities pertaining to PDS proposals received from Implementing Agencies of National Hydrology Project.
- Processing of PDS proposals for review and revision.
- Compiling and updating the status of PDS proposals and powerpoint presentation.
- Attended the monthly review meeting of NHP on 12.6.2017 at MoWR, New Delhi.
- Conducted (as Member Secretary) the following meetings and undertaken follow-up actions:
 - Expert Committee for PDS: 6 April 2017, New Delhi
 - First R&D Session on PDS: 13-14 July 2017, Roorkee
 - Second R&D Session on PDS: 19-20 September 2017, Roorkee
 - Third R&D Session on PDS: 6 March 2018, Roorkee

3. **Hydrological Information System Management Technical Group (HISMG-Technical)**

- Attended the first meeting of HISMG-Technical on 30.1.2018 at Central Water Commission, New Delhi and presented the status of PDS proposals and guidelines.

[F] **INTERNATIONAL GROUNDWATER CONFERENCE (IGWC 2017)**

- Reviewed 16 Abstracts for 7th International Groundwater Conference on “*Groundwater Vision 2030 - Water Security, Challenges & Climate Change Adaptation*” (IGWC 2017).
- Reviewed 11 full length papers for IGWC 2017.
- Prepared speech for Sushree Uma Bharati, Minister of Drinking Water and Sanitation for Inaugural Function of IGWC 2017.
- Attended the International Conference during 11-13 December, 2017 at New Delhi.

[G] **TRANSFER OF TECHNOLOGY**

S. No.	Training Course	Lecture Delivered
1.	Training Course on ‘ <i>Basics of Hydrology</i> ’ organized by NIH at Roorkee during 27 June – 1 July, 2017 under National Hydrology Project	<ul style="list-style-type: none"> ▪ Assessment of Groundwater Potential
2.	Training Course on ‘ <i>Groundwater Hydrology</i> ’ organized by NIH at Roorkee during 21-25 August, 2017 under National Hydrology Project	<ul style="list-style-type: none"> ▪ Groundwater Data Analysis ▪ Groundwater Resource Estimation

[H] **INCIHP**

- Worked as Coordinator, INCIHP (Indian National Committee for International Hydrological Program of UNESCO) during the period 7.8.2017 to 4.10.2017.
- Examined the files and documents related to INCIHP and follow-up actions taken on the minutes of second meeting of INCIHP held on 20.6.2017.
- Visited Wildlife Institute of India, Dehradun (alongwith Dr. Sanjay Kumar Jain) on 15.9.2017 and discussed with Dr. Vinod B. Mathur regarding establishment of UNESCO Category 2 Centre.
- Prepared sections 1, 2, 3 for Request for Action (RFA) towards the establishment of Regional Centre on Water and Environment for South Asia under the Auspices of UNESCO Category 2 Centre jointly at NIH, Roorkee and IIT, Roorkee.

[I] ACHIEVEMENTS REVIEW COMMITTEE (ARC)

- Worked as Member-Secretary, Achievements Review Committee with effect from 25.9.2017.
- Conducted (as Member-Secretary) the following meetings, prepared highlights and undertaken other follow-up actions:
 - First Meeting of ARC on 23 October, 2017 at NIH, Roorkee (with Director and Heads of scientific divisions) and visit to Nuclear Hydrology Laboratory.
 - Second Meeting of ARC during 18-19 November, 2017 at NIH, Roorkee (with Scientific Divisions, Scientists, Scientific Staff and Mr. R. D. Singh, Ex-Director, NIH).
 - Third Meeting of ARC on 31 January, 2018 at Central Water Commission, New Delhi.

[J] E-GOVERNANCE ACTIVITIES

- Worked as Chairman, e-Governance Cell with effect from 13 July 2017.
- Review of the status of various e-Governance activities and follow-up actions.
- Compiled the information related to e-Governance for Annual Report of NIH for the year 2016-17.
- Examined the proposed home pages and menus for re-designing of NIH website through an empanelled vendor by NICSI, New Delhi.

[K] JAL CHETNA

- Worked as Chief Editor for जल चेतना (Technical Magazine of NIH).
- Conducted (as Chief Editor) the meeting of Editorial Board for जल चेतना (Technical Magazine of NIH) on 16.5.2017.

[L] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	House Allotment Committee for NIH Staff Colony	19.5.2017, 11.7.2017, 14.8.2017, 28.9.2017, 20.12.2017, 10.1.2018, 26.2.2018, 21.3.2018
2.	Member	Group Purchase Committee (on behalf of Head, GWH)	16.6.2017
3.	Member	राजभाषा कार्यान्वयन समिति	21.12.2017, 16.3.2018

[M] SPECIAL PURPOSE COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	Screening Committee for Technical Book Writing in Hindi Award Scheme for the year 2016	16.5.2017 8.8.2017 22.11.2017
2.	Chairman	Purchase of Colour Laser Printer and Monitor for Dr. N. C. Ghosh	22.6.2017
3.	Chairman	Committee for entering into Annual Rate Contract for food catering service at NIH, Roorkee	29.6.2017
4.	Chairman	e-Office Governance Structure	-

[N] MEETINGS ATTENDED

S. No.	Group/Committee/Body	Dates	Place
1.	45 th meeting of Working Group of NIH	11-12 May, 2017	NIH, Roorkee
2.	70 th meeting of Technical Advisory Committee (TAC) of NIH	1 September, 2017	CWC, New Delhi
3.	78 th meeting of Governing Body of NIH	21 September, 2017	MoWR, New Delhi
4.	46 th meeting of Working Group of NIH	8-9 February, 2018	NIH, Roorkee

[O] EDITORIAL BOARD MEMBER

➤ Working as Editorial Board Member for the following Journals.

1. International Journal of Water Resources and Environmental Management

http://serialsjournals.com/editorial-board.php?journals_id=192

2. American Journal of Water Resources
<http://www.sciepub.com/journal/AJWR/editors>
3. Advances in Engineering & Scientific Research
<http://advancejournals.org/advances-in-engineering-and-scientific-research/editorial-board/>
4. International Journal of Current Trends in Engineering & Research
<http://www.ijcter.com/editorial-board/>
5. Earth Science India
<http://www.earthscienceindia.info/members.aspx>
6. Current World Environment
<http://www.cwejournal.org/editorial-board/>

[P] MISCELLANEOUS

1. Prepared draft guidelines and finalized the application format for '*Technical Book Writing in Hindi Award Scheme*'.
2. Nominated as alternate member as representative of Director, NIH for the Central Level Expert Group constituted for over-all supervision of the re-assessment of ground water resources (as on 31 March 2017) for the entire country.
3. Presented overview of Ground Water Hydrology division in the 45th meeting of Working Group of NIH held during 11-12 May, 2017.
4. Evaluated the Hindi essays on the topic “आधुनिक भारत में हिन्दी का योगदान” (non-technical category) for Essay Competition organized during ‘Hindi Month 2017’.
5. Prepared the address of Minister of State for Water Resources for 37th Annual General Meeting of NIH Society, held on 13 February, 2018.
6. Evaluated the answer sheets of written examination for the post of Scientist ‘B’.
7. Moderated the following electronic discussion groups on Yahoo!
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)

Year 2016-2017

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the following technical studies and projects:
 - *Peya Jal Suraksha* - Development of Six Pilot Riverbank Filtration Demonstrating Schemes in Different Hydrogeological Settings for Sustainable Drinking Water Supply (November 2015 to April 2018) sponsored by MoWR, RD & GR under Plan Fund
 - *Groundwater Fluctuations and Conductivity Monitoring in Punjab* (January 2016 to December 2017) in association with British Geological Survey, UK
 - *Baseline Data Collection and Analysis of Mewat District, Haryana* (March 2016 to March 2017)
 - *Feasibility of Aquifer Recharge by Flood Water Moderation and Well Fields Development along Yamuna River for Drinking Water Scarcity in NCT Delhi*
2. Guidance to Mr. Vikrant (Karunya University, Coimbatore) for his M.Tech. project entitled “*Soil Moisture Flow Modelling using HYDRUS 1D*”.
3. Review of 22 technical papers for the following Journals –
 - American Journal of Mathematical Analysis
 - American Journal of Water Resources (2)
 - Current Science
 - Current World Environment
 - Hydrology: Current Research (2)
 - International Journal of Hydrology Science and Technology (2)
 - International Journal of Water
 - Journal of Climatology & Weather Forecasting
 - Journal of Earth Science & Climatic Change
 - Journal of Geography & Natural Disasters
 - Journal of Geosciences and Geomatics
 - Journal of Indian Water Resources Society
 - Journal of the Geological Society of India (2)
 - Journal of Water Resource and Protection
 - KSCE Journal of Civil Engineering
 - Life Sciences Journal - Environment Pollution and Climate Change (2)
 - Water Science and Technology Library (Springer book series)

[B] TECHNICAL REPORTS PREPARED

1. Status Report on "*Baseline Data Collection and Analysis of Hydrological and Hydro-geological Data of Mewat District, Haryana*" (N. C. Ghosh, Gopal Krishan, Surjeet Singh, **C. P. Kumar**, M. L. Kansal, Brijesh Yadav and Lalit Mohan Sharma), National Institute of Hydrology, Roorkee, 12 p.

2. Interim Report on "*Groundwater Fluctuations and Conductivity Monitoring in Punjab*" (N. C. Ghosh, Gopal Krishan, Surjeet Singh, **C. P. Kumar**, Alan MacDonald and Dan Lapworth), National Institute of Hydrology, Roorkee.
3. Status Document on "*Subsurface Water Modeling – Flow and Contaminant Transport*" (N. C. Ghosh, **C. P. Kumar**, Anupma Sharma, Surjeet Singh and M. K. Jose), Centre for Excellence for Hydrological Modelling, National Hydrology Project, National Institute of Hydrology, Roorkee, 64 p.

[C] TECHNICAL PAPERS PUBLISHED

1. **Kumar, C. P.** (2016), "*Modelling Flow and Transport in Unsaturated Zone*", Global Journal of Engineering Science and Research Management (GJESRM), ISSN: 2349-4506, Volume 3, Issue 3, March 2016, pp. 48-53.
2. **Kumar, C. P.** (2016), "*Sea Water Intrusion in Coastal Aquifers*", EPRA International Journal of Research & Development (IJRD), ISSN: 2455-7838, Volume 1, Issue 3, May 2016, pp. 27-31.
3. **Kumar, C. P.** (2017), "*Groundwater Studies at National Institute of Hydrology, Roorkee, India*", International Journal of Current Trends in Engineering & Research (IJCTER), e-ISSN: 2455–1392, Volume 3, Issue 1, January 2017, pp. 1–15.
4. **Kumar, C. P.**, B. K. Purandara and A. G. Chachadi (2017), "*Subsurface Water Modelling using SWIM and FEFLOW*", Asia Pacific Journal of Research, ISSN (Print): 2320-5504, ISSN (Online): 2347-4793, Volume I, Issue XLVII, January 2017, pp. 7-19.

[D] REGIONAL CONSULTATION ATTENDED

- Attended the DFID CRISSA (Climate Research and Information Services in South Asia) Regional Consultation: Towards Greater Coordination among Climate Researchers and Policy makers in South Asia during 7-8 April, 2016 at New Delhi.
- As a Panelist, presented reflection for the session '*Groundwater Resilience to Climate Change and Abstraction in the Indo-Gangetic Basin*' in DFID CRISSA Regional Consultation.

[E] NATIONAL HYDROLOGY PROJECT (NHP)

1. Centre of Excellence for Hydrologic Modelling

- Worked as Coordinator and Team Leader for preparation of status document on '*Subsurface Water Modeling – Flow and Contaminant Transport*' as a part of the document "*Hydrological Modelling – Current Status and Future Directions*" for the "Centre of Excellence for Hydrologic Modelling" proposed to be established at NIH under National Hydrology Project.

- Examined, edited and revised the status document on “*Subsurface Water Modeling – Flow and Contaminant Transport*” (N. C. Ghosh, C. P. Kumar, Anupma Sharma, Surjeet Singh, M. K. Jose) based-upon reviewer comments.

2. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to PDS proposals received from NIH and other Implementing Agencies of National Hydrology Project.
- Inviting PDS proposals from Implementing Agencies of NHP.
- Processing of PDS proposals for review and revision.
- Compiling and updating the status of PDS proposals.
- Editing the draft document on "*Guidelines for Implementation of R&D Program (Purpose Driven Studies)*"

[F] NODAL OFFICER, E-GOVERNANCE

- Follow-up actions related to Nodal Officer, e-Governance.

[G] JAL CHETNA

- Working as Chief Editor for जल चेतना (Technical Magazine of NIH) w.e.f. 26.8.2016.
- Conducted (as Chief Editor) the meeting of Editorial Board for जल चेतना (Technical Magazine of NIH) on 17.10.2016.

[H] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Member	Works & Services Committee	1.6.2016 28.6.2016
2.	Member	e-Governance Cell	-
3.	Member	राजभाषा कार्यान्वयन समिति	27.9.2016 20.1.2017 21.3.2017

[I] SPECIAL PURPOSE COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	Committee to recommend the empanelment of Authorized Medical Attendants / Specialists for the financial year 2016-17	25.4.2016 1.9.2016
2.	Member	Committee to re-formulate the proposal of post-retirement medical facilities in NIH incorporating the views/suggestions of Governing Body	4.5.2016 7.10.2016

3.	Chairman	Committee for entering into Annual Rate Contract for food catering service at NIH, Roorkee	7.10.2016 22.12.2016
4.	Chairman	Committee for procurement of Portable Dissolved Oxygen Meter	21.11.2016 5.1.2017 20.2.2017
5.	Chairman	Committee to investigate the possibilities to wind-up the RBF site at Kuankhera village, Laksar	31.1.2017 1.2.2017

[J] EDITORIAL BOARD MEMBER

➤ Working as Editorial Board Member for the following Journals.

7. International Journal of Water Resources and Environmental Management
http://serialsjournals.com/editorial-board.php?journals_id=192

8. American Journal of Water Resources
<http://www.sciepub.com/journal/AJWR/editors>

9. Advances in Engineering & Scientific Research
<http://advancejournals.org/aesr/editor-board/>

10. International Journal of Current Trends in Engineering & Research
<http://www.ijcter.com/editorial-board/>

11. Earth Science India
<http://www.earthscienceindia.info/members.aspx>

[K] MISCELLANEOUS

1. Looked after the routine duties of Head, Ground Water Hydrology division during the periods 4-14 April, 2016; 25 April – 2 May, 2016; and 8-12 August, 2016.
2. Attended the 44th meeting of Working Group of NIH held during 18-19 April, 2016.
3. Attended the first meeting of Technical Advisory Committee (T. A. C.) of Central Ground Water Board on 30.3.2017 at MoWR, New Delhi.
4. Prepared Annual Action Plan of Ground Water Hydrology division under Swachh Bharat Abhiyan.
5. Evaluated the Hindi essays on the topic “देश की प्रगति में राजभाषा हिंदी का योगदान” (non-technical category) for Essay Competition organized during ‘Hindi Month 2016’.
6. Carried-out Election Duty as *Micro-Observer* at Polling Station 17 of Assembly Constituency 33-Manglaur for Uttarakhand Legislative Assembly Election 2017 held on 15.2.2017.

7. Moderated the following electronic discussion groups on Yahoo!

- hydforum (Hydrology Forum)
- hydrologymodel (Hydrological Modelling)
- gwmodel (Ground Water Modelling)
- rhydrology (Roorkee Hydrology Group)

Year 2015-2016

[A] TECHNICAL STUDIES AND REVIEWS

1. Interaction with NIC and follow-up actions for the proposed study “*Development of Website and e-Portal on Mitigation and Remedy of Arsenic Menace in India*”.
2. Associated with the following technical studies and projects:
 - *Peya Jal Suraksha* - Development of Six Pilot Riverbank Filtration Demonstrating Schemes in Different Hydrogeological Settings for Sustainable Drinking Water Supply (November 2015 to April 2018) sponsored by MoWR, RD & GR under Plan Fund
 - *Groundwater Fluctuations and Conductivity Monitoring in Punjab* (January 2016 to December 2017) in association with British Geological Survey, UK
 - *Baseline Data Collection and Analysis of Mewat District, Haryana* (March 2016 to March 2017)
3. Prepared an Information Brochure on the topic “*Impact of Climate Change on Groundwater*”.
4. Guidance to Mr. Vikrant (Karunya University, Coimbatore) for his M.Tech. project entitled “*Soil Moisture Flow Modelling using HYDRUS 1D*”.
5. Reviewed the proposal for new book entitled “*Industrial Water Resource Management, Challenges and Opportunities for Efficient Water Stewardship*” (Dr. P. K. Sengupta) for publication by Wiley.
6. Review of 11 technical papers for American Journal of Water Resources (3), American Journal of Environmental Protection, Applied Ecology and Environmental Sciences, Journal of the Geological Society of India, International Journal of Climate Change Strategies and Management, Arabian Journal of Geosciences, KSCE Journal of Civil Engineering, Applied Water Science Journal, IWRS Journal of Indian Water Resources Society.

[B] TECHNICAL REPORTS PREPARED

1. Sumant Kumar, 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.
2. M. S. Rao, 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.

[C] TECHNICAL PAPERS PUBLISHED

1. **Kumar, C. P.** (2015), "*Status and Mitigation of Arsenic Contamination in Groundwater in India*", The International Journal of Earth & Environmental Sciences, Volume 1, Issue 1, pp. 1-10.
2. **Kumar, C. P.** (2015), “*Impact of Climate Change on Groundwater System*”, Presented in the International Seminar on ‘Challenges to Ground Water Management : Vision 2050’ organized by Centre for Ground Water Studies, Kolkata during 13-14 November, 2015 at Kolkata.
3. **Kumar, C. P.** and Surjeet Singh (2015), "*Climate Change Effects on Groundwater Resources*", Octa Journal of Environmental Research, ISSN: 2321-3655, Volume 3, Issue 4, October-December 2015, pp. 264-271.
4. **Kumar, C. P.** (2016), "*Contribution of Women in Hydrological Research*", International Journal of Research - Granthaalayah, ISSN: 2350-0530, Volume 4, Issue 1, January 2016, pp. 14-26.
5. **Kumar, C. P.** (2016), "*Assessing the Impact of Climate Change on Groundwater Resources*", IWRA (India) Journal, Indian Geographical Committee of IWRA, ISSN (Print): 2277-1298, ISSN (Online): 2277-1301, Volume 5, Number 1, January 2016, pp. 3-11.

[D] TECHNICAL BOOK

1. The following technical book (Paperback and Kindle editions) was published.

Title : *Groundwater Assessment and Modelling*
 Author : **C. P. Kumar**
 Publisher : CreateSpace - An Amazon Company (Paperback)
 Amazon – Kindle Direct Publishing (Kindle)
 ISBN-10 : 1511520493
 ISBN-13 : 978-1511520492
 Paperback : 332 pages

2. The above technical book was also published by -

(a) Sara Book Publication, Ahmedabad, India.

ISBN : 978-163102158-9

Paperback : 318 pages

(b) LAP LAMBERT Academic Publishing, Germany.

ISBN-10 : 3659691577

ISBN-13 : 978-3-659-69157-7

Paperback : 340 pages

[E] BOOK CHAPTER

- **Kumar, C. P.** (2016), "*Impact of Climate Change on Groundwater Resources*", 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, pp. 198-223.

[F] SEMINAR ATTENDED

- International Seminar on "*Challenges to Ground Water Management : Vision 2050*" organized by Centre for Ground Water Studies, Kolkata during 13-14 November, 2015 at ITC Sonar, Kolkata.

[G] NATIONAL HYDROLOGY PROJECT (NHP)

- Worked as Coordinator and Team Leader for preparation of status document on '*Subsurface Water Modelling – Flow and Contaminant Transport*' as a part of the document "Hydrological Modelling – Current Status and Future Directions" for the "Centre of Excellence for Hydrologic Modelling" proposed to be established at NIH under National Hydrology Project.
- Prepared the following sections of status document on '*Subsurface Water Modelling – Flow and Contaminant Transport*'.
 1. Unsaturated/Vadose Zone Modelling (Section 4)
 2. Data Requirements for Saturated Zone Modelling (Section 7)

[H] TRANSFER OF TECHNOLOGY

S. No.	Workshop/Course	Lecture Delivered
1.	Training Course on ' <i>Integrated Water Resources Development and Management</i> ' organized by NIH at Roorkee during 14-18 September, 2015 for officers of CWC and CGWB	Groundwater Assessment
2.	Training Course on ' <i>Integrated Water Resources Development and Management</i> ' organized by NIH at Roorkee during 30 November – 5 December, 2015 for officers of CWC and CGWB.	Groundwater Assessment

[I] NODAL OFFICER, E-GOVERNANCE

1. Working as “Nodal *Officer for e-Governance Activities of NIH*” with effect from 8.6.2015.
2. Follow-up actions related to Nodal Officer, e-Governance.
3. Attended the meetings of e-Governance Nodal Officers of various organizations under MoWR under the chairmanship of Secretary/Joint Secretary (MoWR) on 12.6.2015 and 11.8.2015 at New Delhi.
4. Visited Lal Bahadur Shastri National Academy of Administration, Mussoorie (Uttarakhand) on 14.9.2015 to see functioning of SARGAM software for e-Governance.
5. Edited the draft of ‘Notice inviting Expression of Interest’ for implementation of e-Governance in NIH.

[J] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Member	Works & Services Committee	19.6.2015, 28.10.2015, 15.12.2015, 13.1.2016, 21.1.2016
2.	Member	e-Governance Cell	3.6.2015

[K] EDITORIAL BOARD MEMBER

➤ Working as Editorial Board Member for the following Journals.

12. International Journal of Water Resources and Environmental Management
http://serialsjournals.com/editorial-board.php?journals_id=192

13. American Journal of Water Resources
<http://www.sci epub.com/journal/AJWR/editors>

14. Advances in Engineering & Scientific Research
<http://advancejournals.org/aesr/editor-board/>

[L] MISCELLANEOUS

1. Looked after the routine duties of Head, Ground Water Hydrology division during the periods 12-27 October 2015 and 8-20 February 2016.
2. Prepared draft of Information Brochure for Ground Water Hydrology division.
3. Evaluated 16 articles for ‘*Pravahini*’ magazine (Hindi) of NIH for the year 2015.

4. Prepared draft reply for Lok Sabha Unstarred Diary No. 682 for 25.2.2016 regarding impact of rising sea level on inland water.
5. Moderated the following electronic discussion groups on Yahoo!
 - hydforum (Hydrology Forum)
 - hydrogymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)

Year 2014-2015

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the following technical studies and projects:
 - Management of Aquifer Recharge (MAR) and Aquifer Storage Recovery (ASR)
 - Water Quality, Hydrogeology and Isotopic Investigations in SW Punjab
 - Water Availability Studies for Sukhna Lake, Chandigarh
 - Estimation of Radon Concentration in Waters and Identification of Paleogroundwater in Part of Punjab Located in Satluj River Basin using Isotopes
 - Review of Groundwater Resources in the Indo-Gangetic Basin: A Case Study on Resilience of Groundwater in the Punjab to Withdrawal and Environmental Change
 - The Structure and Dynamics of Groundwater Systems in Northwestern India under Past, Present and Future Climates
 - The Use of Environmental Isotopes to Assess Sustainability of Intensively Exploited Aquifer Systems in North Eastern Parts of Punjab, India
 - Assessment of Baseflow and its Impact on Water Quality in the Part of Satluj River in India using Environmental Isotopes and Age Dating Techniques
2. Supervised (as Co-Guide) the M. Tech. Dissertation entitled “*Isotopic Characterization of Groundwater in Lower Part of Sutlej Basin*” by Mr. K. Sumanth Dutt in Geological Technology at Department of Earth Sciences, I.I.T. Roorkee (submitted on 9.6.2014).
3. Evaluated the project proposal entitled “*Determination of Causes of High Salinity in Groundwater Using Isotope Techniques along Southern Ramanathapuram Coast, Tamil Nadu*” for Ministry of Earth Sciences.
4. Review of 9 technical papers for Journal of Water Resource and Protection, American Journal of Water Resources, Hydrology Journal of IAH, IWRS Journal (3), Journal of Water Resource and Protection, IGI Global, and Pakistan Journal of Agricultural Sciences.

[B] TECHNICAL REPORTS PREPARED

1. Sharma, Anupma, **C. P. Kumar**, C. K. Jain, Sudhir Kumar, D. S. Rathore, M. S. Rao, Surjeet Singh, Rajan Vatsa, “*Coastal Groundwater Dynamics and Management*

in the Saurashtra Region, Gujarat”, Purpose Driven Study, Hydrology Project – II, National Institute of Hydrology, Roorkee, 122 p.

2. Rai, S. P., **C. P. Kumar**, S. K. Jain, S. K. Verma, “*Identification of Source and Location of Leakage/Seepage from Kaushalya Dam, Haryana*”, Consultancy Project (Sponsored by Irrigation Department, Panchkula, Haryana), National Institute of Hydrology, Roorkee, 55 p.
3. Rao, M. S., Bhishm Kumar, **C. P. Kumar**, Y. R. S. Rao, R. K. Jaiswal, Manish Kumar and Shivam Tripathi, “*National Program on Isotope Fingerprinting of Waters of India*” (DST Sponsored Project, July 2007 to December 2013).

[C] TECHNICAL PAPERS PUBLISHED

1. **Kumar, C. P.** (2014), “*Impact of Climate Change on Agriculture*”, International Journal of Engineering Research and Management (IJERM), ISSN: 2349-2058, Volume 1, Issue 4, July 2014, pp. 151-156.
2. **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, 71 p.
3. **Kumar, C. P.** (2014), “*Assessment of Groundwater Potential*”, Scientific Essay, ISBN (eBook): 978-3-656-75555-5, ISBN (Book): 978-3-656-75556-2, GRIN Publishing GmbH, Munich, Germany.
4. **Kumar, C. P.** (2014), “*Groundwater Data Requirement and Analysis*”, Scientific Essay, ISBN (eBook): 978-3-656-75554-8, ISBN (Book): 978-3-656-75553-1, GRIN Publishing GmbH, Munich, Germany.
5. **Kumar, C. P.** (2014), “*Impact of Climate Change on Groundwater Resources*”, Academic Paper, ISBN (eBook): 978-3-656-75551-7, ISBN (Book): 978-3-656-75552-4, GRIN Publishing GmbH, Munich, Germany.
6. **Kumar, C. P.** (2015), “*Modelling of Groundwater Flow and Data Requirements*”, International Journal of Modern Sciences and Engineering Technology (IJMSET), ISSN: 2349-3755, Volume 2, Issue 2, pp. 18-27.
7. **Kumar, C. P.** and Surjeet Singh (2015), “*Concepts and Modeling of Groundwater System*”, International Journal of Innovative Science, Engineering and Technology (IJISSET), ISSN: 2348–7968, Volume 2, Issue 2, February 2015, pp. 262-271.

[D] TECHNICAL BOOK

- Prepared a technical book titled “*Groundwater Assessment and Modelling*” covering related aspects on assessment of groundwater potential, groundwater data requirement and analysis, basic concepts and guidelines for groundwater modelling, groundwater modelling software, modelling of unsaturated flow, modelling of sea water intrusion, and impact of climate change on groundwater resources.

[E] BOOK CHAPTER

- The chapter on “*Impact of Climate Change on Groundwater Resources*” was accepted for publication in ‘Handbook of Research on Climate Change Impact on Health and Environmental Sustainability’ by IGI Global.

[F] HYDROLOGY PROJECT (Phase – II)

1. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Technical discussions with Principal Investigator (Dr. Anupma Sharma) and project staff regarding computation of water balance components of Minsar river basin for the years 2010-2014.

2. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to Purpose Driven Studies undertaken by NIH and monitoring their progress.
- Compiled the extended summaries of Purpose Driven Studies undertaken by NIH for HP-II report of NIH.

[G] CONSULTANCY PROJECT

Associated with the following consultancy project –

- Identification of Source and Locations of Leakage/Seepage from Kaushalya Dam, Haryana

[H] TRANSFER OF TECHNOLOGY

S. No.	Workshop/Course	Lecture Delivered
1.	Training Course on ' <i>Groundwater Modeling using MODFLOW and MIKESHE</i> ' conducted by NIH and DHI (India) at Roorkee during 2-6 February, 2015	Data Requirements for Groundwater Modelling

[I] HEAD, HYDROLOGICAL INVESTIGATIONS DIVISION

1. Routine matters pertaining to Hydrological Investigations division; discussions with scientists, scientific staff and project staff regarding technical studies, field and laboratory investigations; supervision and associated with other activities by the division (till 30.7.2014).

2. Finalization of agenda notes and minutes for 40th meeting of Working Group of NIH held on 4-5 June 2014.
3. Compiled the required information pertaining to Hydrological Investigations division for Annual Report of NIH for the year 2013-14.

[J] COORDINATOR, HARD ROCK REGIONAL CENTRE, BELGAUM

- Coordination of various activities pertaining to Hard Rock Regional Centre, Belgaum (till 30.7.2014).

[K] ORGANIZATION OF LECTURE

- Organized a presentation on “*Application of Nuclear Magnetic Resonance (NMR) Technology in Groundwater*” by Dr. Elliot Grunewald, Chief Geophysicist, Vista Clara Inc., USA on 22.5.2014 at NIH, Roorkee.

[L] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Member	GPC (Group Purchase Committee)	25.6.2014
2.	Member	Works & Services Committee	1.4.2014, 6.6.2014, 23.6.2014, 1.8.2014, 29.9.2014, 24.3.2015
3.	Member	e-Governance Cell	4.8.2014, 18.11.2014

[M] IMPLEMENTATION OF ISO 9001:2008

1. Revised the list of roles and responsibilities of Scientists and Staff Members of Hydrological Investigations division and communicated to all concerned.
2. Revised the ‘Organizational Chart’ and ‘Activities Chart’ for Hydrological Investigations division.
3. Compiled the details of funds received during the year 2013-14 and expected during the year 2014-15 by Hydrological Investigations division through sponsored and consultancy projects.
4. Prepared *Achievements of Quality Objectives (2013-14)* and *Planning of Quality Objectives (2014-15)* in respect of Hydrological Investigations division.
5. Got the Internal Audit conducted on 9.4.2014 for Hydrological Investigations division.

[N] MISCELLANEOUS

1. Looked after the routine duties of Head, Ground Water Hydrology division during the periods 17-20 November 2014, 23 February – 4 March 2015, and 16-20 March 2015.
2. Prepared reply for Lok Sabha Starred Question Diary No. 2030 for 4.3.2015 regarding desalination of groundwater.
3. Finalization of the agenda notes in respect of Ground Water Hydrology division for 42nd meeting of Working Group held on 19-20 March, 2015.
4. Carried out the election duty as Zonal Magistrate for Sectors 10/11/12/13 of Khanpur-32 Assembly Constituency (Haridwar) in General Elections - 2014.
5. Worked as 'Editorial Board Member' for "*American Journal of Water Resources*".
6. Moderated the following electronic discussion groups on Yahoo!
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)

Year 2013-2014

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the study "*Quantification of Impact of Rainwater Harvesting on Groundwater Availability in Aravalli Hills – Part II: Mathematical Modeling*", discussions with Dr. Anupma Sharma regarding VS2DT simulations, and computation of saturated hydraulic conductivity from soil texture for 43 data sets of Savna watershed.
2. Edited the project proposal entitled "*Impact of Forest Cover Changes on Groundwater Resources in Uttara Kannada District, Karnataka*" for submission to Ministry of Earth Sciences.
3. Review of 14 technical papers for IWRS Journal, Journal of Water Resource and Protection, Water Resources Management (Springer), Indian National Science Academy, Advancement in Scientific and Engineering Research, Water Policy, Arabian Journal of Geosciences, KSCE Journal of Civil Engineering (2), Environmental Monitoring and Assessment, Journal of Soil Science and Environmental Management, PEDOSPHERE, Applied Water Science, and American Journal of Water Resources.
4. Review of 7 abstracts for International Conference on "*Advances in Water Resources Development and Management*" (AWRDM-2013).

[B] TECHNICAL REPORTS PREPARED

Final Reports

1. Rai, S. P., Manohar Arora, **C. P. Kumar** and Rakesh Kumar (2013), "*Estimation of Snow and Glacier Melt Contribution in Melt Water of Gangotri Glacier at Gaumukh using Isotopic Techniques*" (Internal Study, April 2010 - March 2013).
2. Garg, P. K., Sudhir Kumar, **C. P. Kumar**, M. S. Rao, Tanveer Ahmed, Rajesh Agarwal and Gopal Krishan (2013), "*Hydro-geological Assessment of Ghar Area for Artificial Recharge and Water Management Planning*" (Internal Study, April 2011 – March 2013).

Interim Reports

3. Khobragade, S. D., **C. P. Kumar**, A. R. Senthil Kumar and Manohar Arora (2013), "*Assessment of Sensitivity of Open Water Evaporation to Increase in Temperature for Different Climatic Regions of India*" (Internal Study, April 2012 - March 2014).
4. Rao, M. S., **C. P. Kumar** and Gopal Krishan (2013), "*Water Quality, Hydrogeology and Isotopic Investigations in SW Punjab*" (Internal Study, July 2012 - June 2014).

[C] TECHNICAL PAPERS PUBLISHED

1. **Kumar C. P.** (2012), "*Assessment of Impact of Climate Change on Groundwater Resources*", Water and Energy International, ISSN: 0974-4711, Volume 69, Number 8, August 2012, pp. 25-31.
2. Singh, Surjeet, **C. P. Kumar**, Anupma Sharma and Rajan Vatsa (2012), "*Quantification of Groundwater Recharge using Visual HELP in Sonar Sub-basin of Madhya Pradesh*", Journal of Indian Water Resources Society, Volume 32, Number 3-4, July-October 2012, pp. 23-31.
3. **Kumar, C. P.** (2013), "*Water Status and Problems in India*", Journal of Environmental Science, Computer Science and Engineering & Technology (JECET), E-ISSN: 2278-179X, Volume 2, Issue 1 (December 2012 – February 2013), pp. 114-128.
4. **Kumar, C. P.** (2013), "*Numerical Modelling of Ground Water Flow using MODFLOW*", Indian Journal of Science, ISSN: 2319-7730, E-ISSN: 2319-7749, Volume 2, Number 4, February 2013, pp. 86-92.
5. **Kumar, C. P.** (2013), "*Assessment and Strategies for Development Potential of Deeper Confined Aquifers in India*", Asian Academic Research Journal of Multidisciplinary, ISSN: 2319-2801 (Online), Volume 1, Issue 8, April 2013, pp. 247-258.
6. **Kumar, C. P.** (2013), "*Recent Studies on Impact of Climate Change on Groundwater Resources*", International Journal of Physical and Social Sciences (IJPS), ISSN: 2249-5894, Volume 3, Issue 11, November 2013, pp. 189-221.

7. Krishan, Gopal, M. S. Rao, **C. P. Kumar** and Prabhat Semwal (2013), "*Identifying Salinization Using Isotopes and Ion Chemistry in Semi-Arid Region of Punjab, India*", Journal of Geology & Geosciences, ISSN: 2329-6755, Volume 2, Issue 4, 1000129.
8. **Kumar, C. P.** (2013), "*Hydrological Studies Using Isotopes*", International Journal of Innovative Research & Development (IJIRD), ISSN: 2278-0211, Volume 2, Issue 13, December 2013, pp. 8-15.

[D] TECHNICAL DOCUMENTS PREPARED

1. Sharma, Anupma and **C. P. Kumar** (2013), Base Paper on “*Coastal Aquifer Management including Use of Hydraulic Barriers for Control of Seawater Ingress*” for National Water Mission.
2. Rai, S. P., Surjeet Singh, **C. P. Kumar** and V. C. Goyal (2014), "Reconnaissance Survey of Rainwater Harvesting (RWH) Structures Constructed in Arvari and Maheshwara River Catchments by Tarun Bharat Sangh, Rajasthan".

[E] BOOK CHAPTERS

The following chapters were published in the book titled “*Lakes, Rivers & Coastal Wetlands - Recent Perspectives*” (Editors: S. Vasudevan, T. Ramkumar, S. R. Singarasubramanian, R. S. Kumar, G. Ramesh), New Academic Publishers, New Delhi, 2013.

1. *Prediction of Water Availability in Sukhna Lake at the End of Summer 2013* (Suhas Khobragade, **C. P. Kumar**, R. D. Singh, Rajasree, S. R. and Prabhat Semwal), pp. 45-55.
2. *Impact of Silt Detention Structures in Catchment on the Water Availability of Sukhna Lake, Chandigarh* (Suhas Khobragade, **C. P. Kumar**, A. R. Senthil Kumar, Prabhat Semwal and R. D. Singh), pp. 68-79.
3. *Evaporation Studies for a Shallow Lake in a Humid Tropical Region of India* (S. D. Khobragade, **C. P. Kumar**, Prabhat Semwal, A. R. Senthil Kumar and R. D. Singh), pp. 101-112.

[F] HYDROLOGY PROJECT (Phase – II)

1. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Technical discussions with Principal Investigator (Dr. Anupma Sharma) and project staff regarding status of progress, field investigations, isotope results, use of WMS software, and impact of climate change.

2. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to Purpose Driven Studies undertaken by NIH and monitoring their progress.
- Participated in the Workshop on Purpose Driven Studies organized by PCS and TAMC during 21-23 May, 2013 at New Delhi to review the progress of implementation of Purpose Driven Studies by various states and central implementing agencies.

3. Decision Support System (Planning)

- Attended the Final Workshop on “*Decision Support System (DSS) Planning*” on 8.8.2013 at New Delhi.

[G] CONSULTANCY PROJECTS

Associated with the following consultancy projects –

1. Pre-dredging Bathymetric Survey of Ramgarh Taal, Gorakhpur (U.P.) (completed in May 2013)
2. Integrated Hydrological Investigations of Sukhna Lake, Chandigarh for its Conservation and Management (July 2011 – June 2013)
3. Identification of Source and Locations of Leakage/Seepage from Kaushalya Dam, Haryana (completed in March 2014)

[H] TRANSFER OF TECHNOLOGY

S. No.	Workshop/Course	Lectures Delivered
1.	Brain Storming Session on ‘ <i>Water Resources in Punjab: Management and Scope for Development</i> ’ jointly organized by NIH, Roorkee and Irrigation & Power Research Institute, Amritsar on 17.4.2013 at Amritsar	(1) Assessment of Groundwater Resources
2.	Training Workshop on ‘ <i>Ground Water Resources Management</i> ’ conducted by Hard Rock Regional Centre, NIH at Belgaum during 11-13 December, 2013 (under World Bank aided Hydrology Project, Phase-II)	(2) Assessment of Groundwater Potential (3) Groundwater Data Requirement and Analysis
3.	Training Course on ‘ <i>Application of GIS to Groundwater Modeling and Management</i> ’ conducted by NIH at Roorkee during 10-21 February, 2014 for officers of Ground Water Department, Rajasthan	(4) Groundwater Data Requirement and Analysis (5) Assessment of Groundwater Potential

4.	Training Course on ' <i>Coastal Groundwater Development, Modeling & Management</i> ' conducted by NIH and GWRDC at Ahmedabad (Gujarat) during 3-7 March, 2014 (under World Bank aided Hydrology Project, Phase-II)	(6) Groundwater Data Requirement and Analysis (7) Assessment of Groundwater Potential
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[I] WORKSHOPS ATTENDED

1. Participated in the National Workshop on "*Role of Isotopes in Groundwater Management in India*" organized under HP-II during 12-14 November, 2013 at NIH, Roorkee.
2. Attended (on 10th March 2014) the Regional Workshop on "*Aquifer Mapping & Management*" organized by Central Ground Water Board, North Western Region, Chandigarh during 10-11 March, 2014.

[J] HEAD, HYDROLOGICAL INVESTIGATIONS DIVISION

1. Routine matters pertaining to Hydrological Investigations division; discussions with scientists, scientific staff and project staff regarding technical studies, field and laboratory investigations; supervision and associated with organization of training courses and other activities by the division.
2. Finalization of agenda notes and minutes for 38th and 39th meetings of Working Group of NIH held on 3-4 April 2013 and 21-22 October 2013 respectively.
3. Compiled the required information pertaining to Hydrological Investigations division for NIH website.
4. Compiled the required information pertaining to Hydrological Investigations division for Annual Report of NIH for the year 2012-13.
5. Compiled the required information pertaining to Hydrological Investigations division for agenda notes and attended the 33rd Annual General Meeting of NIH Society on 17.7.2013 at New Delhi.
6. Prepared Information Brochure for Hydrological Investigations division.
7. Attended the 66th meeting of Technical Advisory Committee (TAC) on 29.7.2013 at New Delhi.
8. Edited the Information Brochure on Isotope Laboratory.
9. Prepared a note on activities of Hydrological Investigations division for Training Manual for Orientation Program of newly appointed scientists.
10. Compiled the database for training management in respect of Hydrological Investigations division (as required by MoWR).

11. Prepared and delivered the presentation on “*Activities of Hydrological Investigations Division*” in the ‘Orientation Training Course for Newly Appointed Scientists’ conducted during 17-21 December, 2013 at NIH, Roorkee.
12. Prepared the monthly targets of Hydrological Investigations division for the year 2014-15.

[K] COORDINATOR, HARD ROCK REGIONAL CENTRE, BELGAUM

1. Coordination of various activities pertaining to Hard Rock Regional Centre, Belgaum.
2. Edited the agenda notes, attended 23rd RCC meeting of HRRC-Belgaum held on 13.6.2013 at Bangalore, and edited the minutes.
3. Edited the required information pertaining to HRRC-Belgaum for Annual Report of NIH for the year 2012-13.
4. Compiled the required information pertaining to Hard Rock Regional centre, Belgaum for agenda notes of 33rd Annual General Meeting of NIH Society.
5. Visit to Hard Rock Regional Centre, Belgaum during 10-13 December, 2013; discussion with scientists and staff of HRRC-Belgaum regarding preparation and plan for Training Course on “*Ground Water Resources Management*”, activities of regional centre and general issues; delivered two lectures in the Training Course; and visit to Karnataka Neeravari Nigam Limited (Irrigation Department), Belgaum for discussion with Chief Engineer regarding allocation of office building for HRRC-Belgaum.

[L] ORGANIZATION OF BRAIN STORMING SESSION, INTERNATIONAL CONFERENCE & TRAINING COURSE

1. Associated (as Co-Coordinator) with organization of Brain Storming Session on “*Conservation and Management of Sukhna Lake*” jointly organized by NIH, Roorkee and Department of Zoology, Panjab University, Chandigarh on 7.5.2013 at Chandigarh.
2. Associated with Organizing Committee of the International Conference on “*Advances in Water Resources Development and Management*” organized by Department of Geology, Panjab University, Chandigarh and NIH, Roorkee during 23-25 October, 2013 at Chandigarh.
3. Associated (as Co-PI) with organization of Training Course on “*Coastal Groundwater Development, Modeling & Management*” jointly organized by NIH and GWRDC Ltd. during 3-7 March, 2014 at Ahmedabad under PDS component of Hydrology Project, Phase-II.

[M] PERMANENT COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Member	GPC (Group Purchase Committee)	9.4.2013, 6.6.2013, 4.7.2013, 5.9.2013, 25.10.2013, 19.11.2013, 9.1.2014, 5.2.2014, 25.3.2014
2.	Member	Works & Services Committee	7.6.2013, 17.6.2013, 5.8.2013, 30.8.2013, 24.10.2013, 20.12.2013, 27.1.2014

[N] SPECIAL PURPOSE COMMITTEES

S. No.	Chairman/ Member	Committee	Meetings
1.	Chairman	DPC (Departmental Promotion Committee) for the posts of Technician Gr. I, Technician Gr. II, and third MACP	12.4.2013
2.	Chairman	Development of NIH website, as per GIGW norms, through an empanelled firm	12.4.2013
3.	Chairman	Investigation of the cause of fire incidence on 11.3.2013 in room number 208 of Guest House No. 1 and assessment of total damage	Investigations
4.	Chairman	Walk-in-Interview for selection of SRF	16.5.2013
5.	Chairman	Rate contract for toner cartridges for photocopier machines and FAX machines installed in NIH	4.6.2013 1.7.2013
6.	Member	Selection Committee for 12 posts of Research Intern	11.6.2013
7.	Chairman	Purchase of GPS and Bailer Sampler	19.6.2013
8.	Chairman	Walk-in-Interview for selection of JRF	20.6.2013
9.	Chairman	Technical Evaluation Committee to finalize the technical bids of 'Annual Rate Contract of Computers and Peripherals'	25.6.2013 26.6.2013
10.	Chairman	Walk-in-Interview scheduled for selection of SRF/JRF	27.6.2013
11.	Chairman	Selection of JRF from the panel-list of Walk-in-Interview conducted on 20.6.2013	5.7.2013
12.	Chairman	Walk-in-Interview for selection of Junior Technical Assistant	19.7.2013
13.	Chairman	Walk-in-Interview for selection of Project Officer	5.8.2013
14.	Chairman	Nomination of awards for work in Hindi	13.8.2013
15.	Member	Judging Committee for 'Debate Competition' as part of Vigilance Awareness Week celebrations	30.10.2013

[O] IMPLEMENTATION OF ISO 9001:2008

1. Prepared "*Planning of the Quality Objectives*" (ISO-9001:2008) in respect of Hydrological Investigations division for the year 2013-14.

2. Compiled the funds received under sponsored and consultancy projects during the year 2012-13 and expected during 2013-14.
3. Prepared the table of achievements of the quality objectives for the year 2012-13.
4. Got the first year's Surveillance Audit on 13.11.2013 by M/s SWISSCERT team in respect of Hydrological Investigations division.

[P] MISCELLANEOUS

1. Nominated as 'Editorial Board Member' for "*American Journal of Water Resources*".
2. Checked the tender notice for AMC of computers and peripherals.
3. Evaluated (as a member of Judging Committee) twenty essays on "जल संरक्षण एवं जल गुणवत्ता" for the competition organized for school children, as a part of Water Conservation Year – 2013 celebrations.
4. Compiled recommendations of the National Workshop on "*Role of Isotopes in Groundwater Management in India*" organized under HP-II during 12-14 November, 2013 at NIH, Roorkee.
5. Checked (as a member of committee) four articles for *Jal Chetna* magazine (Hindi).
6. Edited the following web pages -
 - Water Resources and Hydrology Journals
 - Publications of C. P. Kumar
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
7. Moderated the following electronic discussion groups on Yahoo!
 - hydforum (Hydrology Forum)
 - hydrogymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)

Year 2012-2013

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the study "*Quantification of Impact of Rainwater Harvesting on Groundwater Availability in Aravalli Hills – Part II: Mathematical Modeling*" (April 2010 - March 2013), field visit to the study area (Savna watershed) near Udaipur during 20-22 June, 2012 and geophysical survey.

2. The following report was completed –
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.
3. Conducted four walk-in-interviews (as Chairman of the Selection Committees) for appointment of Research Scientist–C, Research Associate, SRF (2), JRF, Project Officer under various projects.
4. Prepared the powerpoint presentation (Hydrological Investigations division) for Brain Storming Session on “*R & D in Hydrology and Water Resources*” held on 17.12.2012 on the occasion of 35th Foundation Day of NIH.
5. Review of a project proposal for Indian National Committee on Ground Water (INCGW).
6. Review of 4 technical papers for Current Science Journal (3) and IWRS Journal.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2012), "*Assessing the Impact of Climate Change on Groundwater Resources*", India Water Week 2012 - Water, Energy and Food Security : Call for Solutions, 10-14 April 2012, New Delhi.
2. Mittal, Sanjay and C. P. Kumar (2012), “इंदिरा गाँधी नहर परियोजना, चरण - 2 के RD 838 पर मृदा गठन द्वारा मृदा विशिष्टताओं का आकलन”, NISCAIR Online Periodicals Repository, Bharatiya Vaigyanik evam Audyogik Anusandhan Patrika (BVAAP), Vol. 20, No. 1, June 2012, pp. 141-145.
3. Kumar, C. P. and Sanjay Mittal (2012), “भारत में जल की स्थिति एवं समस्याएँ”, Jal Chetna, Technical Magazine, National Institute of Hydrology, Roorkee, Vol. 1, No. 1, July 2012, pp. 6-13.
4. Singh, Surjeet, C. P. Kumar, Anupma Sharma and Rajan Vatsa (2012), "*Quantification of Groundwater Recharge using Visual HELP in Sonar Sub-basin of Madhya Pradesh*", Journal of Indian Water Resources Society, Volume 32, Number 3-4, July-October 2012, pp. 23-31.
5. Kumar, C. P. (2012), "*Groundwater Modelling Software - Capabilities and Limitations*", IOSR (International Organization of Scientific Research) Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT), ISSN: 2319-2402, Volume 1, Issue 2 (September - October 2012), pp. 46-57.
6. Kumar, C. P. (2012), "*Climate Change and Its Impact on Groundwater Resources*", Research Inventory: International Journal of Engineering and Science, ISSN: 2278-4721, Volume 1, Issue 5 (October 2012), pp. 43-60.

7. Kumar, C. P. (2012), "*Assessment of Groundwater Potential*", The International Journal of Engineering and Science (IJES), ISSN: 2319–1813, Volume 1, Issue 1 (November 2012), pp. 64-79.
8. Kumar, C. P. (2012), "*Numerical Model Parameters for Simulation of Contaminant Transport*", International Journal of Scientific Research and Reviews (IJSRR), ISSN: 2279–0543, Volume 1, Issue 3 (October - December 2012), pp. 45-63.

[C] HYDROLOGY PROJECT (Phase – II)

1. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Technical discussions with Principal Investigator (Dr. Anupma Sharma) and project staff regarding status of progress, proposed budget, additional locations for water sampling and TLC measurements, measurements of river cross-sections, and design of recharge structures proposed to be constructed.
- Visit to Gandhinagar, Porbandar and Rajkot during 14-19 June, 2012 for discussions; retrieval of data from CTD-Divers; sampling of groundwater and measurements of groundwater level and conductivity (through TLC Meter) in piezometers and observation wells; interpretation of geophysical survey; and meeting with DSS team members (Surface Water and Groundwater).

2. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to Purpose Driven Studies undertaken by NIH and monitoring their physical and financial progress.
- Obtained quarterly progress reports from Principal Investigators and updated the status of progress in tabular and text formats for all Purpose Driven Studies.
- Attended the Workshop on Purpose Driven Studies organized by PCS and TAMC during 27-28 June, 2012 at New Delhi to review the progress of implementation of Purpose Driven Studies.
- Prepared a powerpoint presentation on physical progress of PDS (required for review of progress of Hydrology Project, Phase-II in respect of NIH by Special Secretary, MoWR on 28.2.2013).

[D] CONSULTANCY PROJECTS

Associated with the following consultancy projects -

1. Integrated Hydrological Investigations of Sukhna Lake, Chandigarh for its Conservation and Management (July 2011 – June 2013)

2. Identification of Source of Seepage/Leakage around Lake Nainital, District Nainital, Uttarakhand (completed in December 2012)

[E] TRANSFER OF TECHNOLOGY

1. Delivered the following lecture in the Training Course on “*Project Hydrology*” organized by NIH, Roorkee during 23 April – 4 May, 2012 for 20 participants from African countries.
 - Water Balance Analysis
2. Delivered the following lectures in the Training Course on “*Hydrological Investigation Techniques for Water Resource Development & Management*” organized by NIH at Roorkee during 27-30 August, 2012 under Hydrology Project, Phase-II.
 - Assessment of Groundwater Potential
 - Groundwater Data Requirements and Analysis
3. Delivered the following lecture in the Training Course on “*Hydrological Investigations for Conservation and Management of Lakes*” organized by NIH at Roorkee during 15-18 January, 2013.
 - Assessment of Groundwater Potential
4. Delivered the following lectures in the Training Course on “*Coastal Groundwater Monitoring, Assessment & Management*” jointly organized by NIH, Roorkee and Gujarat Water Resources Development Corporation Ltd. during 4-8 March, 2013 at Rajkot (Gujarat) under the PDS component of Hydrology Project, Phase-II.
 - Assessment of Groundwater Potential
 - Groundwater Data Requirement and Analysis

[F] SEMINAR ATTENDED

Attended the Regional Seminar on “*Water Quality Assessment and Management of Kerala State*” conducted during 5-6 February, 2013 at Trivandrum (Kerala) jointly by Hard Rock Regional Centre, NIH, Belgaum; Kerala State Irrigation Department; and Kerala State Ground Water Department under PDS component of Hydrology Project, Phase-II.

[G] COORDINATOR, HARD ROCK REGIONAL CENTRE, BELGAUM

With reference to Office Order No. 37 (No. 6/14/2012-NIH dated April 30, 2012), taken-over the charge of Coordinator, Hard Rock Regional Centre, Belgaum on 30.4.2012.

1. Coordination of various activities pertaining to Hard Rock Regional Centre, Belgaum.

2. Visit to Hard Rock Regional Centre, Belgaum on 29-30 May 2012 for discussions with scientists and staff members regarding technical studies, projects, laboratory equipment, software, infrastructure facilities and other miscellaneous issues.
3. Visit to Hard Rock Regional Centre, Belgaum on 2-3 August 2012 to attend the Brain Storming Session on “*Hydrology of Hard Rock Areas*” and 22nd meeting of Regional Coordination Committee (RCC).

[H] NIH ANNUAL REPORT

Coordination and miscellaneous follow-up actions related to compilation and printing of Annual Report of NIH for the year 2011-2012 (as Chairman of the Committee).

[I] E-GOVERNANCE

1. Attended the meeting of High Powered Committee on e-Governance on 7.5.2012 at Ministry of Water Resources, New Delhi.
2. Prepared draft reply to three parliament questions related to ‘e-Governance in water resources’.

[J] IMPLEMENTATION OF ISO 9001:2008

1. Examined the draft Procedure Manual and Quality Manual of ISO-9001:2008 and prepared observations/comments.
2. Prepared list of roles and responsibilities of Scientists and Staff Members of Hydrological Investigations division and communicated to all concerned.
3. Prepared ‘*Organizational Chart*’ and ‘*Activities Chart*’ for Hydrological Investigations division.
4. Prepared and edited ‘*Planning of the Quality Objectives*’ in respect of Hydrological Investigations division.

[K] MISCELLANEOUS

1. Routine matters pertaining to Hydrological Investigations division; discussions with scientists, scientific staff and project staff regarding technical studies, field and laboratory investigations; supervision and associated with organization of training courses and other activities by the division.
2. Attended the 39th meeting of INCOH on 14.5.2012 at New Delhi.
3. Attended the 65th meeting of Technical Advisory Committee (TAC) on 14.5.2012 at New Delhi.
4. Nominated as a senior member of committee constituted for development of NIH website, as per GIGW norms based on Content Management System, through an empanelled firm (NIC).

5. Finalized (alongwith Dr. Anupma Sharma) revised menu items for new NIH website to be developed under domain name nihroorkee.gov.in .
6. Attended the 29th meeting of Standing Committee of Governing Body of NIH on 18.8.2012 at Roorkee.
7. Compiled a note for Expert Group to consider the applicability of research findings (in respect of Hydrological Investigations division).
8. Attended the 1st meeting of the Expert Group to consider the '*applicability of research findings of NIH and suggest a road map for future endeavours*' on 19.9.2012 at New Delhi.
9. Attended the 73rd meeting of Governing Body of NIH on 3.12.2012 at MoWR, New Delhi.
10. Checked 3 papers for *Jal Chetna* magazine (Hindi).
11. Reviewed the existing (1981) Bye-laws of NIH and prepared suggestions for modifications.
12. Attended (as a member) the meetings of GPC on 25.7.2012 and 30.1.2013.
13. Attended (as external member) on 11.3.2013 the meeting of committee to evaluate the research work of Ms. Nirmal Yadav to upgrade her scholarship to SRF in Department of Mathematics, IIT-Roorkee.
14. Associated (as senior member of the Technical Evaluation Committee) with evaluation of technical bids for AMC of computers and peripherals.
15. Associated (as senior member of the Committee) for inspection and testing of servers delivered at NIH Headquarters.
16. Associated (as senior member of the Committee) for inspection and testing of network for '*Campus Wide Networking along with Network Security and Management Solution*'.
17. Associated (as Chairman of the Committee) for disposal of unserviceable material in the NIH campus.
18. Edited the following web pages -
 - Water Resources and Hydrology Journals
 - Publications of C. P. Kumar
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
19. Downloading a number of useful softwares from the internet and their installation.

Year 2011-2012

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the study "*Quantification of Impact of Rainwater Harvesting on Groundwater Availability in Aravalli Hills – Part II: Mathematical Modeling*" (April 2010 - March 2012), VS2DT trial runs, and preparation of Interim Report.
2. Associated with the study "*Impact of Climate Change on Dynamic Groundwater System in a Drought Prone Area*" (April 2009 – March 2012).
3. Prepared lecture notes and powerpoint presentation on "*Water Balance Analysis*" for training course on 'Project Hydrology' to be organized at NIH, Roorkee for 20 participants from African countries.
4. Review of NIH technical report entitled "*Estimation of Groundwater Recharge due to Rainfall in Kandi Belt of Jammu*" (Dr. Vivekanand Singh, 2004).
5. Review of three project proposals for Indian National Committee on Ground Water (INCGW); Centre for Earth Science Studies, Thiruvananthapuram; and BARC, Mumbai.
6. Review of 15 technical papers for International Journal of Water Resources and Environmental Engineering (2), Water and Enviro-Modeling Group Journal (2), e-Journal Earth Science India (2), International Journal of Hydrological Science and Technology, Pedosphere (International Journal), Arabian Journal of Geosciences, National Symposium on Jal Sansadhno Ke Prabandhan Me Naveentam Takneekon Ka Prayog (2), National Symposium on Water Resources Management in Changing Environment (4).

[B] TECHNICAL PAPERS PUBLISHED

1. Mittal, Sanjay and C. P. Kumar (2011), "*Indira Gandhi Nahar Pariyojna, Charan-2 Ke RD838 Par Mrida Gathan Dwara Mrida Vishishtaon Ka Aakalan*", National Conference on "Jal Sansadhno Ke Prabandhan Me Naveentam Takneekon Ka Prayog", 16-17 December 2011, Roorkee.
2. Kumar, C. P. and Surjeet Singh (2012), "*Impact of Climate Change on Groundwater Resources – Status of Research Studies*", Proceedings of 3rd International Conference on Climate Change and Sustainable Management of Natural Resources, 5-7 February 2012, Gwalior.

[C] HYDROLOGY PROJECT (Phase – II)

1. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Regular technical discussions with Principal Investigator (Dr. Anupma Sharma) and project staff regarding progress of study, estimation of water balance components, design of seepage meter, procurement of equipment and other follow-up actions.
- Associated with processing and analysis of data – surface water balance, groundwater balance, soil moisture retention characteristics, TLC graphs, saturated hydraulic conductivity from soil texture.
- Visits to Gandhinagar, Ahmedabad, Porbandar and Rajkot during 8-19 June 2011, 14-21 November 2011 and 24-28 January 2012 for discussions; collection of required data; field investigations (CTD-Diver, Aquameter CRM Auto Resistivity Meter and TLC Meter) in the study area in Porbandar district; downloading of CTD-Diver data; and conducting interview for the post of JRF.

2. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to Purpose Driven Studies undertaken by NIH and monitoring their physical and financial progress.
- Attended the Workshop on Purpose Driven Studies organized by PCS and TAMC during 20-21 September, 2011 at New Delhi to review the progress of implementation of Purpose Driven Studies.
- Obtained quarterly progress reports from Principal Investigators and updated the status of progress in tabular and text formats for all Purpose Driven Studies.

[D] SYMPOSIUM ATTENDED

Attended the National Symposium on “*Water Resources Management in Changing Environment*” organized by IAH during 8-9 February, 2012 at NIH, Roorkee.

[E] NIH ANNUAL REPORT

Coordination and miscellaneous follow-up actions related to compilation and printing of Annual Report of NIH for the year 2010-2011 (as Chairman of the Committee).

[F] E-GOVERNANCE

1. Prepared a note on setup and e-Governance activities at NIH proposed for 12th Plan SFC.
2. Attended the 2nd meeting of High Powered Committee on e-Governance (21.6.2011) and presentation on e-Office (6.7.2011) at Ministry of Water Resources, New Delhi.

[G] MISCELLANEOUS

1. Attended the 64th meeting of Technical Advisory Committee (TAC) on 1.6.2011 at New Delhi.

2. Attended the Fifth Meeting of the Central Level Expert Group for overall re-assessment of ground water resources of the country on 13.10.2011 at New Delhi.
3. Attended the kickoff-meeting on “*Saph Pani – Enhancement of Natural Water Systems and Treatment Methods for Safe and Sustainable Water Supply in India*” during 3-4 November, 2011 at New Delhi.
4. Supported in finalization of technical evaluation of tender bids for networking.
5. Associated with the verification of networking items; and assessing the functionality and serviceability of the items kept in the Computer Centre.
6. With reference to Office Order No. 26 (No. 6/14/2011-NIH(SAO) dated Dec. 29, 2011), taken-over the charge of “*Head, Hydrological Investigations Division*” on 30.12.2011 from Dr. Bhishm Kumar.
7. Routine matters pertaining to Hydrological Investigations division and discussions with scientists, scientific staff and project staff regarding their work plan studies and other assigned activities.
8. Carried-out Election Duty as Micro-Observer (code 118) at Polling Station 11, 12 (Government Primary School No. 2, Atmalpur Bongla) of Assembly Constituency 27-Jwalapur (SC) on 30.1.2012.
9. Attended the meeting of ‘Performance Evaluation Committee’ on 10th Plan Activity (2002-2007) and ARC recommendations (2004-2010) on 28.2.2012 at New Delhi.
10. Attended the 32nd Annual General Meeting of NIH Society on 10.3.2012 at New Delhi.
11. Nominated as ‘Editorial Board Member’ for International Journal of Water Resources and Environmental Management (IJWREM).
12. Created the technical group “*Isotope Hydrology*” on Yahoo! Groups.
13. Edited the following web pages -
 - Water Resources and Hydrology Journals
 - Publications of C. P. Kumar
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
14. Downloading a number of useful softwares from the internet and their installation.

Year 2010-2011

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the study "*Quantification of Impact of Rainwater Harvesting on Groundwater Availability in Aravalli Hills – Part II: Mathematical Modeling*" (April 2010 - March 2012), field visit to the study area (Savna watershed in Udaipur district) during 30 August - 3 September, 2010 and discussions with 'Wells for India'.
2. Associated with the study "*Impact of Climate Change on Dynamic Groundwater System in a Drought Prone Area*" (April 2009 – March 2012).
3. Prepared an article on "*Water Status and Problems in India*" for Jal Chetna magazine (Hindi).
4. Reviewed the draft final report of the research project "*Integration of Fuzzy Logic and GIS for Delineating Groundwater Source Areas in Bazada Land of Solani River Basin*" for INCGW.
5. Evaluation of five research project proposals received by CSIR for funding.
6. Review of four technical papers for Episodes Journal of International Geoscience (one), WAMIP-2010 Regional Workshop at Chandigarh (two), and Indian Journal of Science and Technology (one).

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. and Sanjay Mittal (2010), "*Determination of Soil Hydraulic Properties in a Part of Hindon River Catchment using SOILPROP Software*", *ISH Journal of Hydraulic Engineering*, Volume 16, No. 2, September 2010, pp. 13-27.
2. Kumar, C. P. and Surjeet Singh (2011), "*Impact of Climate Change on Water Resources and National Water Mission of India*", *Proceedings of National Seminar on Global Warming and its Impact on Water Resources*, 14 January 2011, Kolkata, pp. 1-9 (Volume 1).

[C] HYDROLOGY PROJECT (Phase – II)

1. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Visits to Gandhinagar, Ahmedabad, Porbandar and Rajkot during 12-17 April, 2010 and 3-14 January, 2011 for discussions; collection of required data, reports and maps; and field visit to the study area in Porbandar district.
- Associated with examining and processing of collected data, reports and maps.
- Regular technical discussions with Principal Investigator (Dr. Anupma Sharma) and project staff regarding progress, estimation of water balance components and other follow-up actions.

2. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to Purpose Driven Studies undertaken by NIH and monitoring their physical and financial progress.
- Attended the meeting with TAMC and PCS on 8-9 September, 2010 at New Delhi regarding review of the technical and financial progress of Purpose Driven Studies.
- Conducted regular PDS meetings of Principal Investigators with Director to discuss technical progress and other issues related to implementation of PDS.
- Obtained quarterly progress reports from Principal Investigators and updated the status of progress in tabular and text formats for all Purpose Driven Studies.

[D] ORGANISATION OF TRAINING COURSE

Associated with organization of the Training Course on “*Coastal Groundwater Modeling & Management*” (under Hydrology Project, Phase-II) jointly organized by NIH, WALMI and GWRDC during 22-26 November, 2010 at Anand (Gujarat).

[E] TRANSFER OF TECHNOLOGY

1. Delivered the following lectures in the Training Course on “*Coastal Groundwater Modeling & Management*” organized by NIH, WALMI and GWRDC under Hydrology Project, Phase-II during 22-26 November, 2010 at WALMI, Anand (Gujarat).
 - Groundwater Modelling
 - Estimation of Groundwater Potential
 - Groundwater Data Requirement and Analysis
 - Case Study Goa – Modelling of a Coastal Aquifer using FEFLOW
 - Impact of Climate Change on Groundwater Resources
2. Delivered the following lecture in the Training Course on “*Climate Change and its Impact on Water Resources*” conducted by The Institution of Engineers (India) - Roorkee Local Centre, IIT-Roorkee, and NIH during 29 November – 3 December, 2010.
 - Impact of Climate Change on Groundwater and Coastal Aquifers
3. Delivered the following lectures in the Training Course on “*Application of GIS to Groundwater Modeling and Management*” organized by NIH at Roorkee during 28 March - 8 April, 2011 for officers of Ground Water Department, Rajasthan.
 - Estimation of Groundwater Potential
 - Groundwater Data Requirement and Analysis

[F] NIH ANNUAL REPORT

Coordination and miscellaneous follow-up actions related to compilation and printing of Annual Report of NIH for the year 2009-2010 (as Chairman of the committee).

[G] E-GOVERNANCE

1. Nominated as Chairman of High Level e-Governance Committee of NIH (vide Office Memorandum No. 6/15/2011-NIH dated Jan. 10, 2011).
2. Prepared draft of Action Taken Report on Recommendations of the 11th Report of the Second Administrative Reforms Commission relating to 'e-Governance – The Smart Way Forward'.
3. Prepared a list of actions for implementation of e-Governance at NIH, Roorkee and wrote letters to concerned officers (Administration, Finance, Computer Centre) to initiate necessary actions.

[H] MISCELLANEOUS

1. Conducted meetings of the Committee on 22.6.2010 and 19.7.2010 to prepare the proposal for Cadre Review for Group B & C Staff.
2. Visited Ganga Plains South Regional Centre, Sagar and conducted (as Chairman) the walk-in-interview on 13.9.2010 for selection of two Junior Research Fellow for two ongoing Purpose Driven Studies under HP-II at Sagar regional centre.
3. Associated with the preparation of tender document for “*Local Area Network with Security Solutions*”.
4. Nominated as a member of committee for publication of “*Jal Chetna*” magazine in Hindi (vide letter no. 6/31/TP/2010 dated 04 January, 2011).
5. Supported in evaluation of eligibility criteria and technical bids for networking; and preparation of ‘*GIGW Compliance Matrix*’ (Guidelines for Indian Government Websites).
6. Edited the following web pages -
 - Water Resources and Hydrology Journals
 - Hydrology Resources on the Web
 - Kumar Links to Hydrology Resources
7. Downloading a number of useful softwares from the internet and their installation.

Year 2009-2010

[A] TECHNICAL STUDIES AND REVIEWS

1. Associated with the study “*Quantification of Impact of Rainwater Harvesting on Groundwater Availability in Aravalli Hills*” (April 2007 - March 2010) and presentation of the progress on 5.3.2010 in the 32nd meeting of the Working Group of NIH.

2. Associated with the study “*Impact of Climate Change on Dynamic Groundwater System in a Drought Prone Area*” (April 2009 – March 2012).
3. Reviewed the various methods of groundwater resources assessment and attended the meetings of MOWR constituted group on 2.6.2009, 1.7.2009, 28.7.2009 and 30.9.2009 at New Delhi for suggesting new and alternate methods of ground water assessment.
4. Review of 3 research project proposals received by CSIR and Kerala State Council for Science, Technology and Environment for funding.
5. Review of the working draft on “*Ground Water Policy – Uttar Pradesh State*” (Janhit Foundation, Meerut) and the draft of “*Guidelines on Geophysical Exploration for Ground Water in Hard Rocks*” (BIS).
6. Review of 3 technical papers received for publication in Hydrology Journal of Indian Association of Hydrologists.

[B] TECHNICAL PAPERS PUBLISHED

1. Mittal, Sanjay, S. L. Srivastava and C. P. Kumar (2009), "*Jal Samasyaen Evam Jal Vigyaniye Anusandhan*", Proceedings of National Conference on 'Varsh 2050 Tak Vishva Me Jal Ki Sthiti: Karan Aur Nivaran', 27th October 2009, Hyderabad, pp. 55-62.
2. Singh, Surjeet and C. P. Kumar (2010), "*Assessment of Groundwater Recharge and Flow Simulation to Study the Impact of Climate Change*", Workshop on Ground Water Resources Estimation, 23-24 February 2010, New Delhi.
3. Singh, R. D. and C. P. Kumar (2010), “*Impact of Climate Change on Groundwater Resources*”, Proceedings of 2nd National Ground Water Congress, 22nd March 2010, New Delhi, pp. 332-350.

[C] SPONSORED PROJECT

Associated with the project “*Study of Rising Ground Water Table in Jodhpur City, and to Evolve a Management Plan to Contain the Rising Trend*” referred by Groundwater Department, Government of Rajasthan.

- Studied the report entitled “*Rising Water Level Problem in Jodhpur Area, Rajasthan*” (CGWB, 2001).

[D] HYDROLOGY PROJECT (Phase – II)

1. Decision Support System (Planning)

Carried out following works as a member of “NIH Working Group on DSS (Planning)”.

- Visited Gandhinagar during the period 17-23 May, 2009 (alongwith DHI Consultants and Dr. Anupma Sharma, Coordinator for Gujarat) for “*Needs Assessment*”.
- Prepared comments on “*Needs Assessment Main Report*”.
- Attended the “*Needs Assessment Workshop*” during 5-6 August, 2009 at New Delhi.
- Prepared the draft of DSS conceptualization and design for “*Conjunctive Use Planning of Surface Water and Groundwater*” module.
- Attended the meeting between officers of CGWB, NIH and DSS consultant on 20.11.2009 at New Delhi regarding distributed groundwater modeling and other related issues for development of DSS (Planning).
- Attended the “*DSS Model Conceptualization Workshop*” on 7.1.2010 at New Delhi.
- Prepared observations on “*Action Taken on the Comments on the DSS Model Conceptualization Report under DSS (Planning)*” and suggestions (as a member of Conjunctive Use Planning module).
- Attended the second meeting of Review Committee of DSS (Planning) on 8.2.2010 at Roorkee.
- Attended the meeting of ‘Supervision Review Mission’ of World Bank with DHI and NIH on 8.3.2010 at New Delhi.
- Attended the meeting between representatives of World Bank, PCS, DHI and NIH regarding groundwater and other issues related to development of DSS (Planning) on 26.3.2010 at New Delhi.

2. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Visit to Gandhinagar, Ahmedabad and Rajkot during 9, 10, 11, 14 December, 2009 for discussions and collection of required data, reports and maps.
- Field visit on 12-13 December, 2009 to salinity prevention works (spreading channels and tidal regulator) in coastal area of Porbandar district and identification of 10 suitable sites for installation of new piezometers in the study area (Minsar basin of Porbandar district).
- Prepared draft format for socio-economic survey in Porbandar.
- Finalization of piezometer depths (for additional piezometers to be installed) in coordination with Dr. Anupma Sharma (Principal Investigator).
- Presentation of the technical progress on 5.3.2010 in the 32nd meeting of the Working Group of NIH.
- Regular technical discussions with Principal Investigator (Dr. Anupma Sharma) and project staff regarding progress and follow-up actions.

3. Coordinator, Purpose Driven Studies (PDS)

- Coordination of various activities pertaining to Purpose Driven Studies undertaken by NIH and monitoring their physical and financial progress.
- Prepared the “*Procurement Procedure for Purpose Driven Studies*”.

- Prepared powerpoint presentation regarding status of physical and technical progress of various Purpose Driven Studies.
- Attended the 7th meeting of HISMG (Tech), Hydrology Project, Phase – II on 25.9.2009 at New Delhi.
- Attended the meeting of MTR (Mid Term Review) Mission (Hydrology Project, Phase-II) on 13.10.2009 at World Bank, New Delhi.
- Attended the Workshop on Purpose Driven Studies (Hydrology Project – II) organized by PCS (MOWR) during 23-24 November, 2009 at New Delhi.
- Attended the Workshop on “*Success Stories and Experiences under HP-II*” on 22.12.2009 at CSMRS, New Delhi.
- Conducted monthly PDS meetings of Principal Investigators with Director to discuss technical progress and other issues related to implementation of PDS at NIH.

[E] TRANSFER OF TECHNOLOGY

1. Associated with the tutorials on ‘*Aquifer Parameter Estimation*’ and ‘*Design of Recharge Structure – Percolation Tank*’ in the Training Workshop on “Artificial Ground Water Recharge & Aquifer Management” conducted by NIH during 5-10 October, 2009 at Kolkata.
2. Delivered a lecture on ‘*Estimation of Groundwater Potential*’ in the Training Course on “Hydrologic Studies for Major and Medium Irrigation Projects” organized by NIH, Roorkee during 26 October – 6 November, 2009 for officers of Irrigation & CAD Department, Andhra Pradesh.

[F] WORKSHOP ATTENDED

National Workshop on “*Impact of Climate Change on Water Resources*” on 21st July, 2009 at New Delhi.

[G] NIH ANNUAL REPORT

Coordination and miscellaneous follow-up actions related to compilation and printing of Annual Report of NIH for the year 2008-2009 (as Chairman of the committee).

[H] MISCELLANEOUS

1. Carried out various tasks and election duty as Sector Officer for 22 polling booths in 29-Jhabrera (Sector-7) for General Elections - 2009.
2. Prepared draft proposal for a training course on “*Groundwater Modelling and Management*” for Tanzanian Water Engineers under the Indo-Lesotho Joint Capacity Building Programme.
3. Indian National Committee on Ground Water (INCGW) nominated me as a member of Expert Panel in “*Surface Water – Ground Water Interaction*” for reviewing R&D project proposals and draft project reports.

4. Examined the networking proposals of Technet, MROTEK and D-Link regarding Networking Solutions for NIH.
5. Presented an episode on “*Impact of Climate Change on Groundwater Resources*” for recording by Educational Multimedia Research Centre (EMMRC), Indian Institute of Technology, Roorkee.
6. Prepared a write-up on the relevant agenda items and attended first meeting of the Working Group (constituted under the committee on sharing data/knowledge available in the Ministry of Water Resources) on 22.2.2010 at New Delhi.
7. Moderated the following electronic discussion groups on Yahoo!:
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)
8. Edited the following webpages -
 - Water Resources and Hydrology Journals
 - Kumar Links to Hydrology Resources
9. Downloading a number of useful softwares from the internet and their installation.

Year 2008-2009

[A] TECHNICAL STUDIES

1. Associated with the ongoing study “*Quantification of Impact of Rainwater Harvesting on Groundwater Availability in Aravalli Hills*”.
2. Collection and review of literature related to rainwater harvesting.
3. Attended the 9th and 10th meetings of “*R & D Advisory Committee on Ground Water Estimation*” on 9.5.2008 and 17.9.2008 respectively.
4. Review of eight technical papers received for publication in International Journal of Water, International Journal of Water Resources and Environmental Management, International Journal of Ecological Economics and Statistics, Current Science, and Hydrology Journal of Indian Association of Hydrologists.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. and Sanjay Mittal (2008), “*Soil Moisture Retention Characteristics and Hydraulic Conductivity for Different Areas in India in Selected States*”, Journal of Soil and Water Conservation, Soil Conservation Society of India, Volume 7, No. 2, June 2008, pp. 41-45.

2. Mittal, Sanjay and C. P. Kumar (2008), “*Determination of Soil Hydraulic Properties in Lokapavani Catchment using SOILPROP Software*”, Proceedings of 13th National Symposium on Hydrology with Focal Theme on ‘Inflow Forecasting during Extremes’, 28-29 August 2008, New Delhi.

[C] SPONSORED PROJECT

Associated with the project “*Hydrological and Hydrogeological Investigations to Assess Causes of Seepage from the Reservoir of Jaswant Sagar Dam in Jodhpur, Rajasthan*” referred by Water Resources Department, Government of Rajasthan.

- Computed the weighted average infiltration rates in Jaswant Sagar reservoir for the period 1973 to 2005 and prepared a brief write-up on “*Seepage Losses from Jaswant Sagar Reservoir*”.
- Computed the runoff volumes for Jaswant Sagar reservoir (through Excel spreadsheet) for rainfall events of 1987 to 1994.

[D] HYDROLOGY PROJECT (Phase – II)

1. Decision Support System (Planning)

Carried out following works as a member of “*NIH Working Group on DSS (Planning)*”.

- Visited Raipur during 27-30 April, 2008 to review and discuss the status of data availability and processing for Chhattisgarh state and attended the first meeting of IDEG (Inter-agency DSS Expert Group of Chhattisgarh state).
- Prepared a general report on Seonath Sub-basin (Chhattisgarh).
- Attended the “*Inception Workshop for DSS (Planning) Consultancy*” during 9-10 February, 2009 at New Delhi.
- Visited Gandhinagar on 11.2.2009 for discussion regarding preparatory activities for DSS (Planning) for Gujarat.

2. Purpose Driven Study (PDS)

Coastal Groundwater Dynamics and Management in the Saurashtra Region, Gujarat (Dr. Anupma Sharma & Mr. C. P. Kumar)

- Visited Gandhinagar on 11.2.2009 for discussion regarding the above PDS proposal.
- Field visit to the identified study area in Porbandar on 12.2.2009 for the above PDS proposal.

[E] IMPACT OF CLIMATE CHANGE

1. Collection and review of literature related to impact of climate change on groundwater resources.
2. Prepared a technical note related to effect of climate change on groundwater, as required by Standing Committee on Agriculture.

[F] TRANSFER OF TECHNOLOGY

Delivered a lecture on “*Groundwater Modelling Software – Limitations and Capabilities*” in short term course on ‘Planning, Analysis and Modeling of Groundwater in Hard Rock Areas’ conducted by Department of Hydrology, Indian Institute of Technology, Roorkee during 1-6 September, 2008.

[G] SYMPOSIUM ATTENDED

1. 13th National Symposium on Hydrology with focal theme on “*Inflow Forecasting during Extremes*” during 28-29 August, 2008 at New Delhi.
2. International Conference on “*Water, Environment, Energy and Society*” (WEES-2009) during 12-16 January, 2009 at New Delhi.

[H] WEES-2009

1. Reviewed 5 technical papers for the Conference.
2. Associated with organization of the Conference as Convener of the sub-committee on *Press and Publicity* (including Photography & Videography).
3. Acted as Rapporteur for the Technical Session on Ground Water (2).

[I] COMPUTER CENTRE

Carried out various activities as Head, Computer Centre (till 1.9.2008).

- Overall management of Computer Centre.
- Supporting Officer-in-Charge, Computer Centre regarding procurement of computers, peripherals, software etc; maintenance contracts; LAN, e-mail and internet services; maintaining NIH website; condemnation & auction process, and other related matters.
- Processing for re-designing of NIH website.

[J] MISCELLANEOUS

1. Acting as a member of “*Library Advisory Committee*”.
2. Contributing as an Associate Editor for “*International Journal of Water Resources and Environmental Management*” (IJWREM).
3. Attended the short course on “*Introduction to ArcGIS 9*” conducted by ESRI, India during 14-18 April, 2008 at New Delhi.
4. Conducted a debate competition as a part of ‘Hindi Week’ celebrations.

5. Presented the two episodes on “*Concepts of Groundwater Modelling*” for recording by Educational Multimedia Research Centre (EMMRC), Indian Institute of Technology, Roorkee.
6. Organized the “*World Water Day – 2009*” at National Institute of Hydrology, Roorkee.
7. Created the “*Yahoo! Groups - archydro*”, an e-mail discussion group on ‘ArcGIS – Geographical Information System’.
8. Moderated the following electronic discussion groups on Yahoo!:
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)
9. Downloading a number of useful softwares from the internet and their installation.

Year 2007-2008

[A] TECHNICAL STUDIES

1. Prepared the technical report entitled “*Modelling of a Coastal Aquifer using FEFLOW*”.
2. Review of four technical papers received for publication in Hydrogeology Journal, Journal of Environmental Monitoring and Assessment, International Journal of Water, and Hydrology Journal of Indian Association of Hydrologists.
3. Review of two project proposals received by DST and CSIR for funding.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2006), "*Groundwater Flow and Contaminant Transport Models: An Overview*", Journal of Applied Hydrology, Association of Hydrologists of India, Volume XIX, No. 1 & 2, January & April 2006, pp. 94-110.
2. Kumar, C. P. (2007), "*Hydrology Discussion Groups on the Net*", Water Digest, Vol. II, Issue 1, March-April 2007, pp. 89-94.
3. Mittal, Sanjay and C. P. Kumar (2007), “*Karnataka Rajya Me Krishna Raja Sagar Command Ke Antargat Lokapavani Jalgrahan Kshetra Kee Mrada Jalaansh Sanchayak Vishishtaayen*”, Proceedings of National Conference on “*Bharatvarsh Ke Aviral Vikas Me Jal Sansadhno Kee Bhoomika*”, 26-27 September 2007, Roorkee, pp. 212-221.

4. Kumar, C. P., A. G. Chachadi, B. K. Purandara, Sudhir Kumar and Raju Juyal (2007), "*Modelling of Seawater Intrusion in Coastal Area of North Goa*", Water Digest, Vol. II, Issue 3, September-October 2007, pp. 80-83.

[C] SPONSORED PROJECT

Associated with the project "*Hydrological and Hydrogeological Investigations to Assess Causes of Seepage from the Reservoir of Jaswant Sagar Dam in Jodhpur, Rajasthan*" referred by Water Resources Department, Government of Rajasthan.

- Field visit to Jaswant Sagar Dam and Jodhpur during 26-27 September, 2007; discussion with various officials; and collection of required data.
- Computed the water loss rates (mm/day) for three gauge ranges for the years 1979 and 1980.
- Derived saturated hydraulic conductivity from soil texture at 9 locations.
- Prepared a note on measured soil characteristics for southern part of the water spread area of Jaswant Sagar dam (for Interim Report).
- Computed UTM coordinates corresponding to latitude-longitude of 16 infiltration test locations in Jaswant Sagar reservoir.

[D] HYDROLOGY PROJECT (Phase – II)

1. Decision Support System (Planning)

Carried out following works as a member of "NIH Working Group on DSS (Planning)".

- Prepared a note on "Blueprint of Proposed DSS for Water Resources Planning".
- Attended the second workshop on "*Preparedness Review for DSS (Planning) for Integrated Water Resources Development & Management*" held during 21-23 August, 2007 at National Institute of Hydrology, Roorkee.

2. Hydrologic Design Aids (Ground Water)

Attended the workshop for Hydrologic Design Aid (Ground Water) on 30.8.2007 at CSMRS, New Delhi.

[E] IMPACT OF CLIMATE CHANGE

Prepared a note on "*Impact of Climate Change on Groundwater*", as a part of the document on 'Climate Change and its Impact on Indian Water Resources'.

[F] TRANSFER OF TECHNOLOGY

Delivered a lecture on "*Groundwater Resources Estimation*" in the training course on 'Sustainable Ground Water Management in Arid and Semi-Arid Region' organized by National Institute of Hydrology, Roorkee during 23 April – 4 May, 2007.

[G] SYMPOSIUM ATTENDED

Attended “*National Ground Water Congress – 2007*” organized by Central Ground Water Board on 11.9.2007 at New Delhi.

[H] COMPUTER CENTRE

Carried out various activities as Head, Computer Centre.

- Overall management of Computer Centre.
- Supporting Officer-in-Charge, Computer Centre regarding procurement of computers, peripherals, software etc; maintenance contracts; LAN, e-mail and internet services; maintaining NIH website; condemnation & auction process, and other related matters.
- Processing for AMC of Personal Computers and Networking System.
- Updating the website of National Institute of Hydrology, Roorkee.
- Processing for re-designing of NIH website.
- Associated with auction process of VAX-11/780 system and its peripherals.

[I] MISCELLANEOUS

1. Associated with organization of training course on “*Sustainable Ground Water Management in Arid and Semi-Arid Region*” during 23 April – 4 May, 2007 at National Institute of Hydrology, Roorkee.
2. Presented the following episodes for recording by Educational Multimedia Research Centre (EMMRC), Indian Institute of Technology, Roorkee.
 - Seawater Intrusion in Coastal Aquifers
 - Modelling of a Coastal Aquifer using FEFLOW
 - Computer Security (3 episodes)
3. Acting as a member of “*Library Advisory Committee*” nominated vide Office Order No. 6/14/2003-NIH(Admn) dated December 01, 2003.
4. Conducted a debate competition as a part of ‘Hindi Week’ celebrations.
5. Created “*Directory of Groundwater Hydrologists*” in the Yahoo! Group – gwmodel (Ground Water Modelling).
6. Moderated the following electronic discussion groups on Yahoo!:
 - hydforum (Hydrology Forum)
 - hydrogymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)
7. Editing of the following web pages:
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar

- Water Resources and Hydrology Journals
8. Downloading a number of useful softwares from the internet and their installation.

Year 2006-2007

[A] TECHNICAL STUDIES

1. The study “*Modelling of a Coastal Aquifer using FEFLOW*” was completed with the following works.
 - Study of FEFLOW 5.1 help files.
 - Data preparation and model setup.
 - FEFLOW simulation runs.
 - Sensitivity analysis for various parameters.
 - Analysis of simulation results.
 - Initiated write-up for technical report.
2. Regression analysis to find van Genuchten parameters at 18 locations in Lokapavani catchment.
3. Review of a technical paper received for publication in Journal of Spatial Hydrology and review of a project proposal received by DST.

[B] TRANSFER OF TECHNOLOGY

Delivered a lecture on “*Concepts and Modelling of Groundwater System*” in the training course on ‘Applications of Modern Techniques in Practicing Hydrology’ organized by National Institute of Hydrology, Roorkee during 9-13 October, 2006 under Hydrology Project, Phase-II.

[C] SYMPOSIUM ATTENDED

Attended the 12th National Symposium on Hydrology with focal theme on “*Groundwater Governance: Ownership of Groundwater and its Pricing*” organized by Central Ground Water Board and National Institute of Hydrology during 14-15 November, 2006 at New Delhi.

[D] HYDROLOGY PROJECT (Phase – II)

1. Associated with finalization of concept paper on “Hydrologic Design Aids (Ground Water)” by CGWB, NIH and CPCB.
2. Carried out following works as a member of “NIH Working Group on DSS (Planning)”.
 - Studied the draft document on “Request for Proposals for Selection of Consultants” and prepared observations/comments/suggestions.

- Prepared proposed schedule and cost estimate for international trainings and study tours.
- Studied and evaluated the Expression of Interest for “Consultancy Services: Development of Decision Support System (Planning) for Integrated Water Resources Development and Management” by Delft Hydraulics.
- Revised the list of prioritized outputs for DSS module on “Conjunctive Use Planning for Surface Water and Groundwater”.

[E] SPONSORED PROJECT

Associated with the project “Regional Hydro-geological Studies around Kasnau-Matasukh Lignite Mines, Nagaur District (Rajasthan)” referred by Rajasthan State Mines and Minerals Limited.

[F] ENQUIRY OFFICER

Conducted departmental enquiry against Mr. Satendra Prasad, Staff Car Driver (Grade-II), Regional Centre, Sagar with reference to Order No. 5/2/88-NIH(Admn.) dated May 3, 2006 and submitted the report of the Enquiry Officer.

[G] COMPUTER CENTRE

Carried out various activities as Head, Computer Centre.

1. Overall management of Computer Centre.
2. Miscellaneous follow-up actions related to local area network; internet and e-mail services; annual maintenance contract with ERNET India.
3. Guiding Officer-in-Charge, Computer Centre regarding procurement of computers and accessories; annual maintenance contract for personal computers and networking system; and other related matters.
4. Updating the website of National Institute of Hydrology, Roorkee.
5. Processed BSNL broadband internet connectivity for Director and Heads of RCMU & scientific divisions.
6. Upgradation of LAN (local area network).
7. Procurement of Symantec Norton Anti-Virus 2006 software.

[H] MISCELLANEOUS

1. Studied/examined the on-going INCOH project proposal on “*Ground Water Recharge Studies in the Thar Desert Terrain of Rajasthan through Surplus Water*” and correspondence with Principal Investigator to monitor its progress.
2. Associated with organization of 12th National Symposium on Hydrology – editing of technical papers; co-convener of Invitation Committee; procurement of memento etc.
3. Acting as a member of “*Library Advisory Committee*” nominated vide Office Order No. 6/14/2003-NIH(Admn) dated December 01, 2003.

4. Acting as a member of “*IAH Executive Committee*” for the term 2005-2006.
5. Conducted a debate competition as a part of ‘Hindi Week’ celebrations.
6. Created “*Directory of Hydrologists*” in the Yahoo! Group – hydforum (Hydrology Forum).
7. Moderated the following electronic discussion groups on Yahoo!:
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)
8. Editing of the following web pages:
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
 - Water Resources and Hydrology Journals
9. Downloading a number of useful softwares from the internet and their installation.

Year 2005-2006

[A] TECHNICAL STUDIES

1. The following actions were taken for the study “*Modelling of a Coastal Aquifer using FEFLOW*”.
 - Measurement of monthly groundwater level data (till August 2005).
 - Bi-monthly groundwater sampling and measurement of salinity in the laboratory (till June 2005).
 - Initial processing of collected and measured data.
 - Preparation of monthly groundwater level contour maps.
 - Resistivity profiling along 4 sections and vertical electrical soundings at 7 locations.
 - Studied the “FEFLOW 5.1 User’s Manual”.
2. Prepared powerpoint presentations on “*Modelling of Seawater Intrusion*” and “*Introduction to Groundwater Modelling*”.
3. Regression analysis to find an empirical relationship between saturated hydraulic conductivity and soil texture (percentages of clay, silt and sand) for 171 sets of soil data.
4. Review of a number of technical papers received for publication in Hydrology Journal of IAH (Paper Ref. 429, 441); Current Science Journal (Ref. No. N395, N55); and Journal of Spatial Hydrology.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2005), "*Hydrology Resources on the Web*", Seminar on Modern Trends in Groundwater Exploration, Conservation and Protection, 25-27 February 2005, Hyderabad, Abstracts Volume, pp. 42-46.
2. Purandara, B. K., N. Varadarajan and C. P. Kumar (2005), "*Modelling of Soil Moisture Movement and Solute Transport in an Agriculture Field – A Case Study*", Journal of the Indian Society of Soil Science, Volume 53, Number 1, March 2005, pp. 41-45.

[C] BOOK CHAPTERS

1. Kumar, C. P. (2006), "*Groundwater Flow Models: An Overview*", In. Groundwater Modelling and Management (Eds. N. C. Ghosh & K. D. Sharma), Capital Publishing Company, New Delhi, pp. 153-178.
2. Kumar, C. P. (2006), "*Management of Groundwater in Salt Water Ingress Coastal Aquifers*", In. Groundwater Modelling and Management (Eds. N. C. Ghosh & K. D. Sharma), Capital Publishing Company, New Delhi, pp. 540-560.

[D] TRANSFER OF TECHNOLOGY

1. Delivered a seminar on "*Modelling of Seawater Intrusion*" on 17.6.2005 for scientists and scientific staff of National Institute of Hydrology, Roorkee.
2. Delivered a lecture on "*Introduction to Groundwater Modelling*" in the workshop on 'Groundwater Modelling with Special Emphasis on Management Issues' organized by National Institute of Hydrology, Roorkee during August 17-18, 2005.

[E] COMMUNICATION AND TELEPHONES (till September 2005)

1. Routine follow-up actions related to Communication division.
2. Editing of the telephone directory.
3. Modifications in the Tender Application Form for proposed "Digital EPABX System".
4. Procurement of push-button telephone instruments.
5. Proposal to 'Condemnation Committee' to declare the CDOT EPABX system obsolete.

[F] COMPUTER CENTRE (from November 2005)

Taken over the charge of Head, Computer Centre vide Office Order No. 6/14/2004-NIH dated Nov. 23, 2005.

1. Miscellaneous follow-up actions related to Computer Centre.
2. Updating the website of National Institute of Hydrology, Roorkee.
3. Correspondence with ERNET India and DCM Data Systems regarding internet connectivity and LAN problems.

4. Submission and processing of the following proposals:
 - Annual Maintenance Contract of personal computers and networking system
 - Permission of Ministry of Water Resources for procurement of messaging system
 - Payment of quarterly subscription charges for VSAT connectivity
 - Payment of quarterly charges for AMC of personal computers and networking system
 - Procurement of 3 laser printers
 - Procurement of 2 laptop computers

[G] MISCELLANEOUS

1. Examined the project proposal on “*Tsunami Impact (with special reference to water quality) in the Kanyakumari Coastal Aquifer, Tamil Nadu, India*” sent by CSIR to National Institute of Hydrology for review.
2. Nominated as a member of the committee constituted for identifying the scope of the content and the services related to Ministry of Water Resources for National Portal Project (to provide single window access to the information and online services being provided by various government departments).
3. Acting as a member of “*Library Advisory Committee*” nominated vide Office Order No. 6/14/2003-NIH(Admn) dated December 01, 2003.
4. Acting as a member of “*IAH Executive Committee*” for the term 2005-2006.
5. Moderated the following electronic discussion groups on Yahoo!:
 - hydforum (Hydrology Forum)
 - hydrologymodel (Hydrological Modelling)
 - gwmodel (Ground Water Modelling)
 - rhydrology (Roorkee Hydrology Group)
6. Editing of the following web pages:
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
 - Google Groups in Hydrology
 - Hydrology Resources on the Web
7. Downloading a number of useful softwares from the internet and their installation.

Year 2004-2005

[A] TECHNICAL STUDIES

1. The following actions were taken for the study “*Modelling of a Coastal Aquifer using FEFLOW*”.

- Field visit to the study area, Goa University and National Institute of Oceanography, Goa.
 - Technical discussions with Dr. A. G. Chachadi, Goa University.
 - Collection of relevant data, literature and maps.
 - Identification of 20 observation wells for monitoring groundwater levels and salinity.
 - Measurement of monthly groundwater level data.
 - Bi-monthly groundwater sampling and measurement of salinity in the laboratory.
 - Measurement of infiltration and hydraulic conductivity at 8 locations.
 - Soil sampling at 8 locations and measurement of soil moisture retention characteristics in the laboratory.
 - Initial processing of collected and measured data.
 - Upgradation of FEFLOW software (FMH3) from v4.7 to v5.1.
 - Studied the “FEFLOW Demonstration Exercise”.
2. Prepared the Interim Report on “*Modelling of a Coastal Aquifer using FEFLOW*” (2004-2005).
 3. Review of a number of technical papers received for publication in Hydrology Journal of IAH (Paper Ref. 423, 425, 427, 429, 434).

[B] TECHNICAL PAPERS PUBLISHED

1. Jose, Mathew K., C. P. Kumar and A. K. Bhar (2004), “*Sustainable Use of Groundwater in North-West India: Database Requirements*”, Harvest Day Seminar on “Sustainable Use of Groundwater in North-West India” organized by Centre for Advancement of Sustainable Agriculture (CASA), 13th April 2004, New Delhi.
2. Kumar, C. P. (2004), “*Hydrology Discussion Groups on Internet*”, Special Article, Hydrology Journal, Indian Association of Hydrologists, Roorkee, Volume 27, Number 1-2, March-June 2004, pp. 117-120.
3. Kumar, C. P. (2004), “*Artificial Groundwater Recharge: A Perspective*”, National Conference on Resource Conserving Technologies for Social Upliftment, 7-9 December 2004, New Delhi.
4. Kumar, C. P. (2004), “*Groundwater Assessment Methodology*”, Electronic Proceedings (CD), XXIII Annual Convention of AHI and National Seminar on Water Resources Management & People's Participation, 10-11 December 2004, Baroda.
5. Kumar, C. P. (2004), “*Constraints in the Numerical Modelling of Salt Water Intrusion*”, Journal of Soil and Water Conservation, Soil Conservation Society of India, Volume 3, No. 3 & 4, December 2004, pp. 185-195.
6. Purandara, B. K., N. Varadarajan and C. P. Kumar (2004), “*Application of Chemical Mass Balance to Water Quality Data of Malaprabha River*”, Journal of Spatial Hydrology, Vol. 4, No. 2, Fall 2004.

7. Kumar, C. P. (2005), "*Basic Conceptions for Groundwater Modelling*", National Conference on Sustainable Management of Water Resources, 28-29 January 2005, Junagadh (Gujarat), India.

[C] THE ENCYCLOPEDIA OF WATER

Article on "*Groundwater Balance*" (GW-1518) accepted for publication in 'The Encyclopedia of Water' to be published by John Wiley & Sons, Inc., New York.

[D] TRANSFER OF TECHNOLOGY

Delivered the following lectures in the Training Course on "*Mathematical Modelling of Groundwater Systems*" organized by Department of Hydrology, Indian Institute of Technology, Roorkee during the period 28 March to 8 April, 2005.

1. Groundwater Balancing
2. Groundwater Flow Models

[E] SEMINAR/WORKSHOP ATTENDED

1. Harvest Day Seminar on "*Sustainable Use of Groundwater in North-West India*", 13 April 2004, organized by Centre for Advancement of Sustainable Agriculture (CASA) at Indian National Science Academy (INSA), New Delhi.
2. International Workshop on "*Creating Synergy between Groundwater Research and Management in South Asia*", 8-9 February 2005, organized by IWMI at National Institute of Hydrology, Roorkee.

[F] ELEVENTH NATIONAL SYMPOSIUM ON HYDROLOGY

1. Conducted the technical sessions of 11th National Symposium on Hydrology with focal theme on Water Quality held at National Institute of Hydrology, Roorkee during 22-23 November, 2004.
2. Prepared and presented the 'Rapporteur's Report' in the technical session on "Ground Water Hydrology" on 22.11.2004.

[G] INQUIRY OFFICER

Conducted departmental enquiry against Mr. Vedpal, Attendant, Meteorological Laboratory with reference to Order No. 15/17/2004-NIH(Admn) dated May 20/21, 2004 and submitted the report of the Inquiry Officer.

[H] COMMUNICATION AND TELEPHONES

1. Routine follow-up actions related to Communication division.
2. Editing of the telephone directory.
3. Replacement of console in telephone exchange.
4. Preparation of specifications and tender document (Tender Notice & Tender Application Form) for "Digital ISDN EPABX System".

5. Installation of internal phones in every room.
6. Submission and processing of the following proposals:
 - Maintenance Contract of EPABX system
 - Procurement of digital ISDN EPABX system
 - Procurement of push-button telephone instruments

[I] MISCELLANEOUS

1. Examined the project proposal on “*Management of Groundwater Resources in Rural India through Scientific and Community Participation Approach*” sent by Department of Science and Technology (DST) to National Institute of Hydrology for review.
2. Acting as a member of “*Library Advisory Committee*” nominated vide Office Order No. 6/14/2003-NIH(Admn) dated December 01, 2003.
3. Elected as one of the Members of IAH Executive Committee for the term 2005-2006.
4. Moderated Yahoo! Groups: hydforum (Hydrology Forum), an electronic discussion group.
5. Created the following web pages:
 - Software User Groups in Groundwater Modelling
 - Google Groups in Hydrology
 - Hydrology Resources on the Web
6. Editing of the following web pages:
 - National Institute of Hydrology, Roorkee
 - National Institute of Hydrology, Belgaum
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
7. Downloading a number of useful softwares from the internet and their installation.

Year 2003-2004

[A] TECHNICAL STUDIES

1. Completion of the technical report entitled “*Experimental Determination of Irrigation Return Flow in a Hard Rock Region*” (2002-2003).
2. The study “*Modelling of a Coastal Aquifer using FEFLOW*” is under progress with extended scope. It was presented for in-house discussions.
3. Associated with preparation of the document on “*The Global and Indian Freshwater Crisis: A Perspective*” (S. K. Jain, Anupma Sharma, Rakesh Kumar, C. P. Kumar).

4. Study of the manual on “*Artificial Recharge of Ground Water*” (CGWB, 1994).
5. Review of a number of technical papers received for publication in Hydrology Journal of IAHR.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2003), "*Conceptualisation in Groundwater Modelling*", Journal of Applied Hydrology, Association of Hydrologists of India, Volume XVI, No. 1, January 2003, pp. 17-28.
2. Purandara, B. K. and C. P. Kumar (2003), "*Hydrologic Characteristics of Soils under Different Land Covers in Ghataprabha Basin*", Journal of The Institution of Engineers (India), Civil Engineering Division, Volume 84, May 2003, pp. 1-5.
3. Kumar, C. P. (2003), "*Estimation of Ground Water Recharge Using Soil Moisture Balance Approach*", Journal of Soil and Water Conservation, Soil Conservation Society of India, Volume 2, No. 1 & 2, June 2003, pp. 53-58.
4. Kumar, C. P. (2003), "*Pitfalls and Sensitivities in Groundwater Modelling*", Journal of The Institution of Engineers (India), Civil Engineering Division, Volume 84, August 2003, pp. 116-120.
5. Kumar, C. P. (2003), "*Basic Guidelines for Groundwater Modelling Studies*", ISH Journal of Hydraulic Engineering, Volume 9, No. 2, September 2003, pp. 11-21.
6. Jain, C. K., C. P. Kumar and M. K. Sharma (2003), "*Ground Water Quality of Ghataprabha Command Area, Karnataka*", Indian Journal of Environ. & Ecoplan., Volume 7, No. 2, pp. 251-262.
7. Jain, C. K., C. P. Kumar and M. K. Sharma (2003), "*Irrigation Water Quality of Ghataprabha Command Area, Karnataka*", Indian Journal of Environ. & Ecoplan., Volume 7, No. 2, pp. 409-420.
8. Mittal, Sanjay and C. P. Kumar (2003), "*Hindon Nadi Jalgrahan Kshetra Ke Upri Bhag Kee Mrada Jalaansh Vishishtaayen*", Proceedings of National Conference on “Jal Sansadhan Ke Kshetra Me Bhavi Chunotian”, 16-17 December 2003, Roorkee, pp. 255-265.
9. Kumar, C. P. and B. K. Purandara (2003), "*Modelling of Soil Moisture Movement in a Watershed using SWIM*", Journal of The Institution of Engineers (India), Agricultural Engineering Division, Volume 84, December 2003, pp. 47-51.
10. Kumar, C. P. (2004), "*Ground Water Balance*", Proceedings of National Seminar on “Effective Conservation of Water and Sustainable Management Techniques”, 2-3 January 2004, SASTRA Deemed University, Thanjavur, pp. 18-38.

[C] BOOK ON GROUNDWATER MODELLING AND MANAGEMENT

Prepared the following chapters for the proposed book on “*Groundwater Modelling and Management*” to be edited by Dr. K. D. Sharma and Dr. N. C. Ghosh, National Institute of Hydrology, Roorkee.

1. Groundwater Flow Models - An Overview
2. Management of Groundwater in Salt Water Ingress Coastal Aquifers

[D] RESEARCH PROJECT

Associated with formulation and submission of a research proposal on “*Development of Technologies for Augmenting Groundwater Reservoirs through Artificial Recharge in Hydrologically Critical Areas of Indo-Gangetic Basin*” (CN 156) for competitive grant funding under the Challenge Program on Water and Food.

[E] TRANSFER OF TECHNOLOGY

Delivered the following lectures in the Training Course on “*Groundwater Assessment and Modelling*” organized by National Institute of Hydrology at Roorkee for U.P. Ground water Department during 9-19 February, 2004.

1. Groundwater Assessment Methodology
2. Groundwater Flow Models
3. Groundwater Modelling Errors

[F] CONFERENCE ATTENDED

Attended the National Conference on “*Jal Sansadhan Ke Kshetra Me Bhavi Chunotian*” held at National Institute of Hydrology, Roorkee during 16-17 December 2003 and presented report of the technical session on “*Satahi Jal Evam Bhujal Uplabdhata*”.

[G] COMMUNICATION AND TELEPHONES

Taken over the charge of Officer-in-Charge, Communication & Telephones (w.e.f. 1.1.2004) vide Office Order No. 6/14/2003-NIH(SAO) dated December 29, 2003.

1. Routine follow-up actions related to Communication division.
2. Editing of the telephone directory.
3. Submission and processing of the following proposals:
 - Procurement of push-button telephone instruments
 - Annual Maintenance Contract of EPABX system
 - Procurement of digital ISDN EPABX system

[H] MISCELLANEOUS

1. Transferred from Hard Rock Regional Centre, Belgaum to Headquarters (Roorkee) vide Office Order No. 6/14/92-NIH(SAO) dated 24/26.02.2003. Accordingly joined at Roorkee on 4.4.2003.

2. Suffered with 'disc slip' and stayed on medical leave during the period 30 July to 25 September, 2003 (58 days).
3. Acting as a member of "Library Advisory Committee" nominated vide Office Order No. 6/14/2003-NIH(Admn) dated December 01, 2003.
4. Nominated as *Associate Editor-in-Chief* for "Journal of Spatial Hydrology" (an international electronic journal available via internet) – ISSN: 1530-4736.
5. Created the "Yahoo! Groups India - hydrologymodel", an e-mail discussion group on 'Hydrological Modelling'.
6. Editing of the following web pages:
 - National Institute of Hydrology, Roorkee
 - Kumar Links to Hydrology Resources
 - Hydrology Links of C. P. Kumar
 - Publications of C. P. Kumar
7. Downloading a number of useful softwares from the internet and their installation.

Year 2002-2003

[A] TECHNICAL STUDIES

1. Completion of the technical report entitled "*Simulation of Solute Transport in Saline Areas of Ghataprabha Command*" (2001-2002).
2. The study "*Experimental Determination of Irrigation Return Flow in a Hard Rock Region*" (2002-2003) is under progress.
3. The study "*Modelling of a Coastal Aquifer using FEFLOW*" (2002-2003) has been initiated and will be continued in 2003-2004.
4. Supervision of technical studies of Hard Rock Regional Centre, National Institute of Hydrology, Belgaum.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2002), "*Modelling of Unsaturated Flow*", Proceedings - National Conference on "Modern Trends in Water Resources Development and Environmental Management", 7-8 March 2002, Vellore Institute of Technology, Vellore (Tamil Nadu), pp. 1-9.
2. Durbude, Dilip G. and C. P. Kumar (2002), "*Application of GIS for the Determination of Morphological Characteristics of Watershed*", Proceedings - National Conference on "Modern Trends in Water Resources Development and Environmental Management", 7-8 March 2002, Vellore Institute of Technology, Vellore (Tamil Nadu), pp. 11-17.

3. Kumar, C. P. (2002), "*Numerical Simulation Models for Seawater Intrusion*", Journal of Indian Water Resources Society, Volume 22, Number 3, July 2002, pp. 125-130.
4. Kumar, C. P. and Shilpa S. Ratnoji (2002), "*Modeling of Solute Transport in Agricultural Fields using SWIM*", Hydrology Journal, Indian Association of Hydrologists, Roorkee, Volume 25, No. 2 & 3, September 2002, pp. 21-32.
5. Kumar, C. P. and P. V. Seethapathi (2002), "*Assessment of Natural Ground Water Recharge in Upper Ganga Canal Command Area*", Journal of Applied Hydrology, Association of Hydrologists of India, Vol. XV, No. 4, October 2002, pp. 13-20.
6. Kumar, C. P. (2002), "*Modelling of Groundwater Flow: A Perspective*", Proceedings of Hydro-2002 Conference on Hydraulics, Water Resources and Ocean Engineering, 16-17 December 2002, Mumbai, pp. 158-162.
7. Kumar, C. P., B. K. Purandara and B. Venkatesh (2002), "*Variation of Soil Moisture Characteristics in a Part of Malaprabha River Catchment*", Proceedings of International Conference on "Hydrology and Watershed Management", 18-20 December 2002, Hyderabad, Volume-I, pp. 522-526.
8. Bhosale, Dipanjali D. and C. P. Kumar (2002), "*Simulation of Seawater Intrusion in Ernakulam Coast*", Proceedings of International Conference on "Hydrology and Watershed Management", 18-20 December 2002, Hyderabad, Volume-II, pp. 390-399.

[C] HYDROLOGY PROJECT

Associated with the R & D proposal "Estimation of Irrigation Return Flow in Lokapavani Area in Krishnarajasagar Command, Karnataka".

[D] WORKSHOP ORGANISED

Organised a workshop on "*Remote Sensing and GIS Applications in Hydrology*" at Belgaum during the period 23-25 September, 2002.

[E] TRAINING ATTENDED

Attended the end user training on "*Ground Water Estimation & Management System*" (GEMS) at Central Ground Water Board, Faridabad during the period 25.11.2002 to 5.12.2002.

[F] MISCELLANEOUS

1. Monitoring (as Head) the various activities of Hard Rock Regional Centre, National Institute of Hydrology, Belgaum.
2. Conducted (as Member Secretary) the 13th meeting of Regional Coordination Committee (RCC) for Hard Rock Regional Centre at Hyderabad on 10.4.2002.

3. Continued in Editorial Board (as one of the consulting editors) of "Journal of Spatial Hydrology" (an electronic journal available via internet) – ISSN: 1530-4736.
4. Editing of the following web pages:
 - Kumar Links to Hydrology Resources
 - National Institute of Hydrology, Belgaum
 - (c) National Institute of Hydrology, Roorkee
5. Downloading a number of useful softwares from the internet and their installation.

Year 2001-2002

[A] TECHNICAL STUDIES

1. Completion of the technical report entitled "*Simulation of Soil Moisture Movement in a Hard Rock Watershed using SWIM Model*" (2000-2001).
2. Collection of literature, visit to the study area (Cambolin, Goa) and ground water sampling for the study "*Modelling of Sea Water Intrusion in a Coastal Aquifer*" (2001-2002).
3. Study of FEFLOW Users Manual.
4. Visit to soil and water conservation structures in Ralegan Siddhi (Ahmadnagar district) for the study "*Assessment of Temporal Changes in the Land Use/Cover due to Micro-Watershed Development*" (2002-2003).
5. Supervision of technical studies of Hard Rock Regional Centre, National Institute of Hydrology, Belgaum.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P. (2001), "*Simulation of Sea Water Intrusion and Tidal Influence*", ISH Journal of Hydraulic Engineering, Volume 7, No. 1, March 2001, pp. 1-11.
2. Kumar, C. P., B. K. Purandara and B. Soni (2001), "*Variation of Soil Moisture Characteristics in Malaprabha and Ghataprabha Sub-basins*", Hydrology Journal, Indian Association of Hydrologists, Roorkee, Volume 24, No. 1, March 2001, pp. 27-36.
3. Kumar, C. P., Digamber Singh and Sanjay Mittal (2001), "*Determination of Saturated Hydraulic Conductivity in Upper Part of Hindon River Catchment*", Hydrology Journal, Indian Association of Hydrologists, Roorkee, Volume 24, No. 2, June 2001, pp. 55-62.
4. Kumar, C. P., Sanjay Mittal and S. L. Srivastava (2001), "*Soil Moisture Retention Characteristics at RD 838 of I.G.N.P. Stage-II*", Journal of Applied Hydrology,

Association of Hydrologists of India, Vol. XIV, No. 2 & 3, April & July, 2001, pp. 17-21.

5. Kumar, C. P., Vijay Kumar and Vivekanand Singh (2001), "*Soil Moisture Characteristics in Upper Part of Hindon River Catchment*", Journal of Applied Hydrology, Association of Hydrologists of India, Vol. XIV, No. 4, October 2001, pp. 1-9.
6. Kumar, C. P. (2001), "*Common Ground Water Modelling Errors and Remediation*", Journal of Indian Water Resources Society, Volume 21, Number 4, October 2001, pp. 149-156.
7. Purandara, B. K., N. Varadarajan and C. P. Kumar (2001), "*Simulation of Soil Moisture Movement and Solute Transport in a Field Soil*", International UNESCO-IHP Workshop on Modelling in Hydrogeology, 3-7 December 2001, Centre for Geoscience and Engineering, Anna University, Chennai, India.
8. Kumar, C. P. and S. M. Seth (2001), "*Derivation of Soil Moisture Retention Characteristics from Saturated Hydraulic Conductivity*", Journal of the Indian Society of Soil Science, Volume 49, Number 4, December 2001, pp. 653-657.

[C] **HYDROLOGY PROJECT**

Associated with the R & D proposal "Estimation of Irrigation Return Flow in Lokapavani Area in Krishnarajasagar Command, Karnataka".

[D] **MISCELLANEOUS**

1. Monitoring (as Head) the various activities of Hard Rock Regional Centre, National Institute of Hydrology, Belgaum.
2. Follow-up actions for twelfth meeting of RCC for Hard Rock Regional Centre, NIH, Belgaum.
3. Continued in Editorial Board (as one of the consulting editors) of "Journal of Spatial Hydrology" (an electronic journal available via internet) – ISSN: 1530-4736.
4. Created the "Yahoo! Groups – gwmodel", an e-mail discussion group on 'Ground Water Modeling'.
5. Editing of the following web pages:
 - Kumar Links to Hydrology Resources
 - National Institute of Hydrology, Belgaum
6. Subscribed the various Hydrology-related e-mail discussion groups.
7. Downloading a number of useful softwares from the internet and their installation.

Year 2000-2001

[A] TECHNICAL STUDIES

1. Derivation of van Genuchten model parameters, plotting of soil moisture retention curves for 32 sites, and completion of the technical report entitled "*Spatial Variation of Soil and Hydrological Characteristics of Selected Watersheds in Hard Rock Region*" (1999-2000) – BKP, CPK, BV, PRR.
2. Completion of the technical report entitled "*Ground Water Quality in Malaprabha Representative Basin, Karnataka*" (2000-2001) – CKJ, KKS, CPK, BKP.
3. Visit to Barchi watershed in Karwar district (Karnataka) and computerization of daily rainfall and evaporation data of Barchi (1996 to 1999) for the study "*Simulation of Soil Moisture Movement in a Hard Rock Watershed using SWIM Model*" (2000-2001).
4. Study of HST3D documentation, preparation of notes, test run of HST3D (DOS version) for example problem and examination of Argus MeshMaker Demo.
5. Supervision of technical studies of Hard Rock Regional Centre, National Institute of Hydrology, Belgaum.

[B] TECHNICAL PAPERS PUBLISHED

1. Kumar, C. P., Manohar Arora and S. L. Srivastava (2000), "*Soil Moisture Retention Characteristics in Upper Part of Hindon River Catchment*", Journal of Indian Water Resources Society, Volume 20, Number 2, April 2000, pp. 76-83.
2. Purandara, B. K. and C. P. Kumar (2000), "*Simulation of Soil Moisture Movement in a Forested Watershed*", ICIWRM-2000, Proceedings of International Conference on Integrated Water Resources Management for Sustainable Development, 19-21 December, 2000, New Delhi, India, pp. 833-839.

[C] HYDROLOGY PROJECT

1. Associated with the R & D proposal "Estimation of Irrigation Return Flow in Lokapavani Area in Krishnarajasagar Command, Karnataka".
2. Visit to Lokapavani command area and six field observation (V-notch and tensiometer) plots, and derivation of soil moisture characteristics (h- θ and K-h relationships) for 14 locations in Lokapavani area through non-linear regression analysis.

[D] WORKSHOP ORGANISED

Organised the workshop on "*Modelling of Hydrologic Systems*" at Hard Rock Regional Centre, National Institute of Hydrology, Belgaum during the period 4-8 September, 2000.

[E] TRANSFER OF TECHNOLOGY

Delivered the following lectures in the workshop on “Modelling of Hydrologic Systems” organised by Hard Rock Regional Centre, National Institute of Hydrology at Belgaum during the period 4-8 September, 2000.

1. Ground Water Balance
2. Modelling of Unsaturated Flow
3. Modelling of Sea Water Intrusion

[F] AWARD

The Institution of Engineers (India) awarded the Certificate of Merit for the paper entitled "*Modelling of Soil Moisture Movement*" published in the Journal of the Institution (Twenty-first day of December, 2000).

[G] SUPERVISION OF M.TECH. DISSERTATION

Supervision (as co-guide) of the M.Tech. (Environmental Engineering) dissertation "*Modelling of Soil Moisture Movement and Solute Transport in an Agricultural Field using SWIM*" (2000-2001) by Miss Shilpa S. Ratnoji of K. L. E. Society's College of Engineering and Technology, Belgaum.

[H] MISCELLANEOUS

1. Monitoring (as Head) the various activities of Hard Rock Regional Centre, National Institute of Hydrology, Belgaum.
2. Arranged the “National Technology Day” celebration on 11.5.2000 (Theme: Technology for Advancement of Science).
3. Edited the brief write-up covering the studies (statewise) carried out by Belgaum regional centre since its inception, as required for the 21st Annual General Meeting of NIH Society on 2nd December, 2000.
4. Prepared the agenda notes for twelfth meeting of RCC for Hard Rock Regional Centre, NIH, Belgaum.
5. Included in Editorial Board (as one of the consulting editors) of "Journal of Spatial Hydrology" (an electronic journal available via internet) – ISSN: 1530-4736.
6. Created the web page “Kumar Links to Hydrology Resources” (<http://www.angelfire.com/nh/cpkumar/hydrology.html>).
7. Created the “Hydrology Forum” (an e-mail discussion group) in ‘Topica’.
8. Subscribed the various Hydrology-related e-mail discussion groups.
9. Downloading a number of useful softwares from the internet and their installation.