

CURRICULUM VITAE

Dr. MANOJ K. JAIN

Male, Indian, Born on September 3rd, 1965.



Profile: Received his B.Tech. degree in Agricultural Engineering and M. Tech. degree in Soil & Water Engineering for College of Agricultural Engineering, JNKVV Jabalpur and PhD in Hydraulics and Water Resources Engineering from **Indian Institute of Technology, Roorkee, India**. Has several years of teaching/research experience in the field of Hydrology & Water Resources Engineering. Published many papers in various national & international journals of repute, national and international conferences. Also published several technical reports.

Research interests and expertise: Watershed Modelling & Management, Development of Spatial Decision Support Systems, Soil Erosion and Sediment Transport Modelling, Distributed Modelling of Rainfall-Runoff Soil Erosion Processes, Remote Sensing and GIS Applications in Hydrology and Watershed Management, Surface Water Hydrology, Spatial and Temporal data Analysis using Image Processing and GIS, Long term Water Resources Management and Modelling.

SUBJECT & FIELD OF SPECIALIZATION : Hydrology: Hydraulics & Water Resources Engineering.

PRESENT POSITION : Assistant Professor
Department of Hydrology
Indian Institute of Technology, Roorkee
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ACADEMIC QUALIFICATIONS:

Degree	Year	Class	Percentage marks/Grade
B.Tech.	1986	1 st	77.8
M.Tech. ⁺⁺	1988	1 st (Honours)	OCCA 4.00/4.00 (Awarded University Gold Medal, Jindal Gold Medal and certificate of Honours)
Ph.D. [*]	2002	--	--

⁺⁺ Thesis entitled: "Model Studies on Partially Penetrating Wells".

^{*} Thesis entitled: "Distributed Modelling of Runoff and Sediment Yield using Remote Sensing and GIS".

PROFESSIONAL EXPERIENCE:(i) **Research / teaching experience:** more than 17 years

Job Title	Employer	From - To	Responsibilities
Assistant Professor	Chairman Board of Governors, IIT, Roorkee, India	12/2006 - Present	To conduct research, teaching, consultancy in hydrology and water resources engineering
Scientist E1	Chairman Governing Body, NIH, Roorkee, India	03/2003 - 11/2006	
Scientist C	Chairman Governing Body, NIH, Roorkee, India	02/1996 - 02/2003	
Scientist B	Chairman Governing Body, NIH, Roorkee, India	02/1990 - 01/1996	

(ii) **Software Development:** Developed software for

- ✚ A GIS based distributed rainfall-runoff soil erosion model
- ✚ A Geomorphological Linear Cascade model
- ✚ Software for computation of time-area diagram from DEM of a catchment
- ✚ Software for computation of distributed unit hydrograph from DEM
- ✚ Software for derivation of distributed sediment delivery ratio from Watershed
- ✚ Software for analysis of large number of events using SCS-CN concept incorporating storm duration

(iii) **Other Technical Activities:**

✚ Working as reviewer for technical papers of:

International Journals	National Journals
1. J. Hydrology, Elsevier Science	1. J. Soil Conservation, Dehradun, India
2. J. Hydrologic Engineering, ASCE, USA	2. J. Indian Water Resources Society, Roorkee, India
3. Hydrological Sciences J., IAHS, UK	3. Hydrology Journal of IAH, Roorkee, India
4. Hydrologic Processes J., UK	
5. J. Water Resources Management, Springer	
6. J. Environmental Management, Elsevier Science	
7. J. Spatial Hydrology, USA	

✚ Worked as **Joint Editor** of Hydrology Journal of IAH.(iv) **Awards and honours:**

- ✚ Certificate of Honors, JNKVV, Jabalpur.
- ✚ University Gold Medal, JNKVV, Jabalpur
- ✚ Jindal Gold Medal, JNKVV, Jabalpur

(v) **Academic activities:**

Courses Taught : Planning and Management of Watersheds (HY-530), Watershed Behaviour and Conservation Practices (HY-531), Forest and Agricultural Hydrology (HY-541).

Laboratory Experiences : Remote Sensing & GIS Lab., Soil Water Lab., Experimental Watershed.

(vi) M.E. / M. Tech. theses guidance:

Sl. No.	Name of student	Thesis Title	Year	Co-supervisor
1	SS Haider	Preliminary Investigations on Soil Moisture Retrieval through Microwave Remote Sensing.	2002	Dr. UC Kothiyari and Dr. Manoj Arora, Dept. of Civil Engg, IIT Roorkee.
2.	Dwi Hari Shanti	Rainfall-runoff modeling using remote sensing and GIS	2005	Dr. SK Mishra, WRDM, IIT, Roorkee.
3.	Deshmukh Sunil Balasaheb	Modelling catchment scale soil erosion patterns using remote sensing and GIS	2005	Dr. VK Pandey, College of Agril. Engineering, IGAU, Raipur.
4.	Dharani Kumar Penki	Modelling of Spring flow using ANN	2006	Dr. VK Pandey, College of Agril. Engineering, IGAU, Raipur.
5.	Nikhil Kumar	Hydrologic simulation of runoff using SWAT model	2007	Dr. SK Mishra, WRDM, IIT Roorkee.
6.	RB Shah	Estimation of Soil Erosion and Sediment Yield using GIS	2007	Dr. SK Mishra, WRDM, IIT Roorkee.
7.	Gunjan Kumar	Runoff Simulation using TOPMODEL.	2007	Dr. SK Mishra, WRDM, IIT Roorkee.
8.	Deepti Joshi	Hydrological studies for small watershed in India using ANSWERS 2000 model	In progress	--
9.	Vinit Kumar Jain	Multi objective hydrological modeling of watershed using SWAT-2005	In progress	--
10.	Devjyoti Das	Identification of critical erosion prone area for watershed prioritization in small watershed using RUSLE, GIS and remote sensing	In progress	--
11.	Sweta Gaur	Simulation of Flood Flows using GIS	In progress	--
12.	Sunil Bagde	Surface hydrologic appraisal of a natural catchment	In progress	Dr. BS Mathur, DOH, IIT Roorkee.

(vii) Ph. D. theses guidance

Sl. No.	Name of student	Reg. Year/ Status	Thesis Title	Co-supervisor(s)	Completed/ Ongoing
1.	S. Sarvanan	2005 (FT)	Distributed rainfall-runoff modeling using remote sensing and GIS	Dr. Z. Ahmad, Dept. of Civil Engg., I.I.T. Roorkee.	In progress
2.	Sanjay Gupta	2007 (FT)	Rainfall-runoff modeling using GIS	Dr. Ranvir Singh, Professor, Dept. of Hydrology, IIT Roorkee	In progress
3.	Dilip G. Durbude	2007 (FT)	Long term hydrologic simulation	Dr. S.K. Mishra, WRDM, IIT Roorkee	In progress
4.	Soban Singh Rawat	2007 (FT)	Rainfall runoff sediment yield modeling of mountainous catchment	Dr. S.K. Mishra and Dr. U.C. Chaube, WRDM, IIT Roorkee	In progress

RESEARCH PUBLICATIONS

(a) INTERNATIONAL JOURNALS:

- J1.** Mishra, S.K., **Jain, M.K.**, Suresh Babu, P., Venugopal, K. And Kaliappan, S. (2007). *Comparison of AMC-Dependent CN-conversion Formulae*. **J. Water Resources Management, Springer**, (DOI: 10.1007/s11269-007-9233-5) (In press).
- J2.** Mishra, S.K., Pandey, R.P., **Jain, M.K.** and Singh, V.P. (2007). *A Rain Duration and Modified AMC-Dependent SCS-CN Procedure for Long Duration Rainfall-Runoff Events*. **J. Water Resources Management, Springer**, (DOI: 10.1007/s11269-007-9196-6) (In press).
- J3.** Sahu, R.K., Mishra, S.K., Eldho, T.I, and **Jain, M.K.** (2007). *An Advanced Soil Moisture Accounting Procedure for SCS Curve Number Method*. **J. Hydrologic Processes**, Vol. 21, No.21, pp. 2872-2881. (DOI: 10.1002/hyp.6503).
- J4.** Rai, R.K., **Jain, M.K.**, Mishra, S.K., Ojha, C.S.P. and Singh, V.P. (2007). *Another Look at Z-transform Technique for Deriving Unit Impulse Response Function*. **J. Water Resources Management, Springer**. Vol. 21, No. 11, pp. 1829-1848. (DOI: 10.1007/s11269-006-9132-1).
- J5.** Mishra, S.K., Sahu, R.K., Eldho, T.I, and **Jain, M.K.** (2006). *A Generalized Relation Between Initial Abstraction and Potential Maximum Retention in SCS-CN-Based Model*. **J. River Basin Management, IAHR**, Vol. 4, Issue 4.
- J6.** **Jain, M.K.**, Mishra, S.K., Babu, P.S., Venugopal, K. and Singh, V.P. (2006). *An Enhanced Runoff Curve Number Model Incorporating Storm Duration and a Non-Linear I_a -S Relation*. **J. Hydrologic Engineering, ASCE**, Vol. 11, No. 6, pp. 631-635.
- J7.** **Jain, M.K.**, Mishra, S.K., Babu, P.S., and Venugopal, K. (2006). *On the I_a -S Relation of the SCS-CN Method*. **J. Nordic Hydrology**, Vol. 37, No. 3, pp. 261-275.
- J8.** **Jain, M.K.**, Mishra, S.K. and Singh, V.P. (2006). *Evaluation of AMC-Dependent SCS-CN-Based Models using Watershed Characteristics*. **J. Water Resources Management, Springer**, Vol. 20, No. 4, pp. 531-552. Available online at doi: 10.1007/s11269-006-3086-1.
- J9.** Mishra, S.K., Sahu, R.K., Eldho, T.I. and **Jain, M.K.** (2006). *An Improved I_a -S Relation Incorporating Antecedent Moisture in SCS-CN Methodology*. **J. Water Resources Management, Springer**, Vol. 20, No. 5, pp. 643-660. Available online at doi: 10.1007/s11269-005-9000-4.
- J10.** **Jain M.K.**, Kothiyari U.C. and Ranga Raju. K.G. (2005). *Geographic Information System based Distributed Model for Soil Erosion and Rate of Sediment Outflow from Catchments*. **J. Hydraulic Engineering, ASCE**, Vol. 131, No. 9, pp. 755-769.
- J11.** **Jain, M.K.** and Singh, V.P. (2005). *DEM Based Modelling of Surface Runoff using Diffusion Wave Equation*. **J. Hydrology, Elsevier Science**, Vol. 302, No. 1-4, pp. 107-126.
- J12.** **Jain, M.K.** and Rai, R.K. (2005). *Rainfall Runoff Modelling of Kolar Catchment using Watershed Modelling System*. **International Agricultural Engineering J.**, Vol. 14, No. 2, pp. 55-66.
- J13.** Mishra, S.K., **Jain, M.K.**, Bhunya, P.K. and Singh, V.P. (2005). *Field Applicability of the SCS-CN-Based Mishra-Singh General Model and its Variant*. **J. Water Resources Management, Springer**, Vol. 19, No. 1, pp. 37- 62.
- J14.** Mishra, S.K., **Jain, M.K.**, Pandey, R.P., and Singh, V.P. (2005). *Catchment Area-Based Evaluation of the AMC-Dependent SCS-CN-Inspired Rainfall-Runoff Models*. **J. Hydrological Processes**, Vol. 19, No. 14, 2701-2718. (doi: 10.1002/hyp.5736).
- J15.** Jain, S.K., Singh, R.D., **Jain, M.K.** and Lohani, A.K. (2005). *Delineation of Flood Prone Areas using Remote Sensing Techniques*. **J. Water Resources Management, Springer**, Vol. 19, No. 4, pp. 333-347.
- J16.** **Jain, M.K.**, Kothiyari U.C. and Ranga Raju. K.G. (2004). *A GIS based Distributed Rainfall Runoff Model*. **J. Hydrology, Elsevier Science**, Vol. 299, No. 1-2, pp. 107-135.

- J17.** Mishra, S.K., **Jain, M.K.**, and Singh, V.P. (2004). *Evaluation of SCS-CN-based Model Incorporating Antecedent Moisture*. **J. Water Resources Management, Springer**, Vol. 18, No. 6, pp. 567-589.
- J18.** Rai, R.K., Patel, R.A.S., Rastogi, R.A. and **Jain, M.K.** (2004). *Response Functions of Suspended Sediment Flow for a Himalayan Watershed*. **International Agricultural Engineering J.**, 13(1&2), pp. 37-46.
- J19.** Mishra, S.K., **Jain, M.K.**, Pandey, R.P. and Singh, V.P. (2003). *Evaluation of the AMC-Dependent SCS-CN-based Models using Large Data of Small Watersheds*. **Water and Energy International J.**, Vol. 60, No. 3, pp. 13-23.
- J20.** Kothyari, U.C., **Jain M.K.** and Ranga Raju K.G. (2002). *Estimation of Temporal Variation of Sediment Yield using GIS*. **Hydrological Sciences J., IAHS**, Vol. 47, No. 5, pp 693-706.
- J21.** **Jain, M.K.** and Kothyari, U.C. (2000). *Estimation of Soil Erosion and Sediment Yield using GIS*. **Hydrological Sciences J., IAHS**, Vol. 45, No. 5, pp. 771-786.
- J22.** Mishra, S.K., **Jain, M.K.** and Seth, S.M. (1997). *Characterization of Flood Waves by Rating Curves*. **Nordic Hydrology**, Vol. 28, No. 1, pp. 51-64.

(b) INDIAN JOURNALS:

- J23.** Mishra, S.K., **Jain, M.K.**, Hawkins, R.H. and Singh, V.P. (2005). *Investigation of the SCS-CN-Inspired General Mishra-Singh Model*. **J. Indian Water Resources Society (IWRS)**, Vol. 25, No. 1, pp. 1-24.
- J24.** Venkatesh, B and **Jain, M.K.** (2000). *Simulation of Daily Flows using Topography based Rainfall Runoff Model*. **J. Institution of Engineers (India)**, Vol. 81, pp. 127-132.
- J25.** **Jain, M.K.** and Soni, B. (1998). *GIS based Rainfall Runoff Modelling of a Catchment*. **Hydrology Journal (IAH)**, Vol. 21, No. 1-4, pp. 53-66.
- J26.** **Jain, M.K.** and Seth S.M. (1997). *Rainfall Runoff Modelling of a Himalayan Catchment using a Distributed Approach*. **J. Institution of Engineers (India)**, Vol. 78, pp. 89-92.
- J27.** **Jain, M.K.**, Seth, S.M. and Ramasastri, K.S. (1996). *Simulation of Daily Runoff of Hemavati Subbasin at Sakfeshpur using Tank Model*. **J. Institution of Engineers (India)**, Vol. 77, pp. 67-71.
- J28.** **Jain, M.K.** and Seth, S.M. (1995). *Derivation of IUH for small Watersheds using a Geomorphological Approach*. **Hydrology Journal (IAH)**, Vol. 18, No. 1&2, pp. 78-92.

(c) INTERNATIONAL CONFERENCES/SYMPOSIUM

- C1.** Sahu, R.K., Mishra, S.K., Eldho, T.I., and **Jain, M.K.** (2007). *Generalization of relationship between antecedent moisture and antecedent rainfall for SCS-CN based rainfall-runoff model*. **6th International R&D Conference by CBIP, Lucknow, India, 13th-16th Feb., 2007**.
- C2.** Sarvanan, S, Ahmad, Z. and **Jain, M.K.** (2006). *Modelling of flood events using spatially distributed unit hydrograph*. **Proc. SPIE, Vol. 6411 – Agriculture and Hydrology Applications of Remote Sensing**, 641113 (Dec. 11, 2006), 10 p. doi:10.1117/12/706274.
- C3.** Sahu, R.K., Mishra, S.K., Eldho, T.I., and **Jain, M.K.** (2006). *An empirical relation between antecedent moisture and antecedent rainfall for use in SCS-CN-based rainfall-runoff model*. **Proc., 15th Congress of Asia and Pacific Division of IAHR and International Symposium on “Maritime Hydraulics” held at IIT Madras, Chennai, India on August 7-10, 2006**; Vol. I, pp. 521-526.
- C4.** Sahu, R.K., Mishra, S.K., Eldho, T.I., and **Jain, M.K.** (2006). *Evaluation of recent SCS-CN-based model incorporating hydrologically sound soil moisture accounting procedure*. **“An International Perspective on Environmental and Water Resources” organized by the Environmental and Water Resources Institute (EWRI) of ASCE and the Indian Institute of Technology (IIT) Kanpur held at New Delhi, India on December 18-20, 2006**.

- C5. Jain, M.K.**, Shanti, D.H. and Mishra, S.K. (2005). *Simulation of runoff hydrograph using time variable isochrone technique incorporating catchment storage*. **Proceedings International Conference, 'Recent Advances in Water Resources Development and Management (RAWRDM-05)**, Vol. I, Nov. 23-25, 2005, IIT, Roorkee, pp 437-447.
- C6.** Pandey, R.P., Rai, R.K., **Jain, M.K.**, Mishra, S.K. and Parida, B.P. (2005). *Stochastic modelling of hydrological drought*. **Proceedings International Conference, 'Recent Advances in Water Resources Development and Management (RAWRDM-05)**, Vol. I, Nov. 23-25, 2005, IIT, Roorkee, pp 322-335.
- C7.** Sahu, R.K., Mishra, S.K., Eldho, T.I. and **Jain, M.K.** (2005). *A modification to the initial abstraction in the existing SCS-CN methodology incorporating storm duration and antecedent rainfall*. **Proceedings International Conference, 'Recent Advances in Water Resources Development and Management (RAWRDM-05)**, Vol. II, Nov. 23-25, 2005, IIT, Roorkee, pp 697-704.
- C8.** Sahu, R.K., Mishra, S.K., Eldho, T.I. and **Jain, M.K.** (2005). *A SCS-CN-Based Model Incorporating Direct Use of Antecedent Rainfall in Runoff Equation*. **Proceedings of the XXXI IAHR Congress on 'Water Engineering for the Future-Choices and Challenges' held at Convention and Exhibition Centre (COEX), Seoul, Korea, 11-16 Sept., 2005**, pp. 3727-3736.
- C9.** Mishra, S.K., Pandey, R.P., **Jain, M.K.** and Singh, Ranveer (2005). *Derivation of AMC and storm duration-dependent curve numbers from daily rainfall-runoff data*. **International Conference on Hydrological Perspectives for Sustainable Development (HYPESD-2005)**, Roorkee, Feb. 23-25, 2005, Allied Publishers Private Limited, New Delhi. Vol-I, pp. 404-419,.
- C10.** Rai, R.K., Pandey, R.P., Harda, M.K., **Jain, M.K.**, Srivastava, S.K. (2005). *Agricultural drought analysis using water balance approach*. **Proc. International Conference on Hydrological Perspectives for Sustainable Development (HYPESD-2005)**, Roorkee, Feb. 23-25, 2005, Allied Publishers Private Limited, New Delhi, Vol-I, pp. 244-251,.
- C11.** Mishra, S.K., Sahu, R.K., Eldho, T.I., and **Jain, M.K.** (2005). *An SCS-CN based method with Ia-S relation modified for antecedent moisture*. **International Conference on Hydrological Perspectives for Sustainable Development (HYPESD-2005)**, Roorkee, Feb. 23-25, 2005, Allied Publishers Private Limited, New Delhi, Vol-I, pp. 396-403,.
- C12.** **Jain, M.K.**, Kothiyari, U.C. and Ranga Raju, K.G. (2003). *Distributed Modelling of Storm Runoff and Sediment Yields using Remote Sensing and GIS*. In: **Singh, V.P. and Yadava, R.N. (eds.)**, **Advances in Hydrology, Proceedings of the Int. Conf. on Water and Environment (WE-2003)**, pp. 303-312, Bhopal, India, Dec. 15-18, 2003.
- C13.** Mishra, S.K., **Jain, M.K.**, Rastogi, A.K., Hawkins, R.H. and Singh, V.P. (2003). *Comparison of the existing and modified SCS-CN methods*. In: **Singh, V.P. and Yadava, R.N. (eds.)**, **Watershed Hydrology, Proceedings of the Int. Conf. on Water and Environment (WE-2003)**, pp. 104-122, Bhopal, India, Dec. 15-18, 2003.
- C14.** Rai, R.K., Srivastava, S.K. and **Jain, M.K.** (2003). *Fitting of frequency distribution function of rainfall for Midnapur district of West Bengal (India) – A case study*. In: **Singh, V.P. and Yadava, R.N. (eds.)**, **Watershed Hydrology, Proceedings of the Int. Conf. on Water and Environment (WE-2003)**, pp. 459-469, Bhopal, India, Dec. 15-18, 2003.
- C15.** Rai, R.K., **Jain, M.K.**, Rastogi, R.A., Shrivastava, S.K. and Choudhury, A. (2003). *Deriving instantaneous unit hydrograph of ARMA(2,2) process using Z-transform technique*. In: **Singh, V.P. and Yadava, R.N. (eds.)**, **Watershed Hydrology, Proceedings of the Int. Conf. on Water and Environment (WE-2003)**, pp. 146-157, Bhopal, India, Dec. 15-18, 2003.
- C16.** **Jain, M.K.** and Singh, R.D. (2002). *Rainfall Runoff Modelling of Upper Narmada Basins using a Geomorphological Approach*. In **Analysis and Practice in Water Resources Engineering for Disaster Management, Proceedings of International Conference on Water Related Disasters (ICWRD-2002)**, Kolkata, Vol. 1, pp. 76-79, New Age International Publisher, New Delhi.
- C17.** **Jain, M.K.** (2000). *Soil erosion modelling using satellite remote sensing and GIS*. **Proceedings, International Conference, ICIWRM-2000**, New Delhi, Dec. 19-21, 2000.

- C18. Jain, M.K., Jain, S.K. Soni B. and Seth S.M. (1998).** *GIS application in watershed modelling - current status. Proceedings, International conference on watershed management and Conservation, CBIP, New Delhi, Dec. 8-10, 1998.*
- C19. Jain, M.K., Mishra, S.K., Jain, S.K., Seth S.M. and Nema R.K. (1997).** *Integration of HEC-1 and GIS for modelling a Himalayan catchment in India. Water Resources Outlook for the 21st Century, IX World Water Congress, Montreal, Canada, Sep. 1-6, 1997, Volume 1, pp., 125-127.,*
- C20. Jain, M.K., Seth S.M. and Ahmad T. (1997).** *Rainfall runoff modelling of Kolar basin using a distributed approach. Proceedings, International Symposium on Emerging trends in Hydrology, University of Roorkee, Roorkee, Sep. 25-27, 1997, Vol. I, pp. 91-100.,*
- C21. Jain, M.K., Mishra S.K. and Seth S.M. (1996).** *Hysteresis criteria for the applicability of CPC and CPMC methods of flood routing. Proceedings, International conference on disaster and mitigation (INCODIM), Anna University, Madras, Jan. 19-22, 1996, Vol. II, pp. B2-20 to B2-32.*
- C22. Jain, M.K. and Ramasastri, K.S. (1992).** *Modelling of Flood Flows in a Mountainous Catchment in Western Ghats. Proceedings, International Symposium on Hydrology of Mountainous Areas, Shimla, India, May 28-30, 1992.*

(d) NATIONAL CONFERENCE/SYMPOSIUM

- C23. Pandey, R.P., Mishra, S.K., Jain, M.K., Singh, R. and Ramasastri, K.S. (2004).** *Assessment of low flow and stream flow drought severity in Ken basin. Procd. of the 11th National Symposium on Hydrology with focal theme on Water Quality, Nov. 22-23, Roorkee, Allied Publishers Pvt. Ltd., New Delhi, pp. 59-69.*
- C24. Jain, M.K. (1999).** *A GIS based method for estimation of soil erosion and sediment yield. Proceedings, National Workshop on Hydrologic and Hydraulic Routing in Alluvial Rivers, Nov. 26-27, 1999, National Institute of Hydrology, Roorkee.*
- C25. Jain, M.K. (1999).** *Geomorphological and Landuse Planning for Danda watershed. Paper presented in National Symposium "Map India 99", New Delhi.*
- C26. Seth, S.M., Jain, S.K., and Jain, M.K. (1999).** *Remote Sensing and GIS Application Studies at National Institute of Hydrology. Paper presented in National Symposium "Map India 99", New Delhi.*
- C27. Jain, M.K. and Ahmad T. (1998).** *Watershed modelling with GIS based distributed unit hydrograph approach. Proceedings, Ninth National Symposium on Hydrology, Amritsar, pp. 317-329.*

(e) PEER REVIEWED TECHNICAL REPORTS

- R1. Jain, M.K. (2004).** *A GIS based distributed rainfall runoff model. Technical Report, National Institute of Hydrology, Roorkee.*
- R2. Jain, M.K. (2001).** *Estimation of Temporal Variation of Sediment Yield using GIS. Technical Report, National Institute of Hydrology, Roorkee.*
- R3. Jain, M.K. (2001).** *Rainfall Runoff Modelling of Kolar Basin using WMS. Technical Report National Institute of Hydrology, Roorkee.*
- R4. Jain, M.K. (2000).** *Estimation of Soil Erosion and Sediment Yield in Karso Catchment using ANSWERS Model. Technical Report National Institute of Hydrology, Roorkee, Report No. CS/AR-22/1999-2000.*
- R5. Senthil Kumar, A.R., Jain, M.K., Jain S.K. and Agarwal P.K. (1999).** *Development of a Distributed Catchment Model. Technical Report National Institute of Hydrology, Roorkee, Report No. TR/BR-16/98-99.*
- R6. Jain, M.K. (1998).** *Geomorphological & Landuse Planning for Danda Watershed (Tehri Garhwal District, U.P). Technical Report National Institute of Hydrology, Roorkee, Report No. CS(AR)-29/97-98.*

- R7. Jain, M.K. (1997). *Watershed modelling with GIS based distributed unit hydrograph approach*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-8/97-98.
- R8. Jain, M.K. (1997). *Soil Erosion and Sediment Yield Modelling using Kinematic Wave in GIS Environment*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(BR)-2/97-98.
- R9. Venkates, B and Jain M.K. (1997). *Application of TOPMODEL to Malaprabha catchment*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-3/97-98.
- R10. Jain, M.K. (1997). *Watershed Modelling with GIS based Distributed Unit Hydrograph Approach*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-8/97-98.
- R11. Jain, M.K. (1996). *GIS based rainfall runoff modelling for Hemavathy catchment*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-22/96-97.
- R12. Jain, M.K. (1996). *Rainfall runoff modelling of Ramganga at Chaukhutia using RAINFLO model*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-199.
- R13. Jain, M.K. (1996). *Estimation of soil erosion and sediment yield using GIS*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-35/96-97.
- R14. Jain, M.K. and Singh U. K. (1995). *Fluvial geomorphological characteristics of four sub-basins of upper Narmada*. Technical Report National Institute of Hydrology, Roorkee Report No. CS(AR)-159.
- R15. Jain, M.K. (1995). *Rainfall runoff modelling of upper Narmada basins using a geomorphological technique*. Technical Report National Institute of Hydrology, Roorkee, Report No. CS(AR) 201.
- R16. Jain, M.K. (1994). *Geomorphological characteristics of Narmada (upto Manot) basin*. Technical Report National Institute of Hydrology, Roorkee, Report No. CS(AR)-128.
- R17. Jain, M.K. (1994). *Daily runoff simulation of Hemavati at Sakleshpur using 4X4 Tank model*. Technical Report National Institute of Hydrology, Roorkee, Report No. CS(AR)-133.
- R18. Jain, M.K. (1994). *Application of WAHS model to Kolar sub-basin*. Technical Report National Institute of Hydrology, Roorkee, Report No. CS(AR)-136.
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