

ISSN 0970-6984



Journal of Indian Water Resources Society



Volume 37

Number 4

October, 2017

JOURNAL OF INDIAN WATER RESOURCES SOCIETY

GUIDELINES FOR AUTHORS

GENERAL INFORMATION

The Indian Water Resources Society (IWRS) is a multi-disciplinary organization dedicated to the advancement of the science and technology of water resources development and management. The IWRS Journal publishes original papers on scientific, engineering and socio-economic aspects that are clear, concise and presented in a style readily understood by an international audience. Before publication, the papers are reviewed by the Editor/reviewers. Detailed instructions for preparing manuscripts are included in the following. A review of previous issues will be helpful in organizing the manuscript.

The text of the paper should be well organized and presented in a logical manner. The appropriate use of subheadings, especially in long sections, enhances the readability and quality of paper. Repetition of data given in tables and figures should be avoided. The paper should be written so that it will be of interest to persons in the wide variety of disciplines represented by IWRS's membership. Complex sentences and the excessive use of highly technical jargon are prime offenders in detracting the readers. The articles should have well-defined objectives, discussions, applications and conclusions that are easily understood. The papers not complying these guidelines will be returned to the authors for improvement or publication elsewhere.

The acceptance or rejection of a paper is based on appraisal by the reviewers who examine the paper for its originality, relevance, adequacy and conciseness of the presentation. Depending on the results of reviewer, a manuscript may be returned to the authors for revision. If the authors suitably revise the manuscript, it is accepted for publication. If the review comments are extensive, the authors should include a reply to the reviewer, in addition to making changes to the manuscript.

Submit two copies of the manuscript typed double spaced on A4 size paper, with 2.5 cm margin on all sides along with clear and legible figures and tables to the Editor, Indian Water Resources Society, Water Resources Development & Management Department, Indian Institute of Technology, Roorkee - 247 667, Uttarakhand. (Add line numbers in the text of your manuscript). The references and abstract must also be double-spaced. Include a CD-ROM with text, tables, and figures. Single-spaced manuscripts, those clumsily typed, or those with inadequate marginal space or unreadable illustrations and tables will be returned. Retain the original manuscript and illustration and send the same to IWRS when your manuscript is approved for publication. The manuscript can also be submitted to editor through e-mail at: editor.iwrs@gmail.com

PREPARATION OF MANUSCRIPT

Title page:

The title should be short, informative and should clearly reflect the content of the paper. The title should not exceed 15 words in length. Terms like Preliminary Investigations, Contributions to, Studies on etc., should be avoided.

The title page should also include the name(s) of the author(s); the affiliation and mailing address of each author; the e-mail address, telephone and fax numbers of the corresponding author.

Abstract:

The abstract should be concise, and complete in itself, without reference to the text of the paper. It should state the general problem and objective(s), summarize the results, and state general implications. The abstract should be in single paragraph of not more than 200 words. Five to Six keywords supplied by the author should appear on a line following the abstract.

References:

Cite references to published literature in the text sorted by author(s) and year, for example, Pasad (1994). Avoid using a numbering system. List all references in alphabetical order in the Reference section. Give the complete title of the reference and the source. Please follow the sample styles below.

Books :

Gupta, S.K., 1999. "Engineering Hydrology", Tata Mc Graw-Hill Publishers, New Delhi

Continued on Inside Back Cover

**President****Er. A.B. Pandya**

Ex-Chairman, Central Water Commission,
New Delhi

Editor**Prof. S.K. Mishra**

Head, Deptt. of WRD & Management
Indian Institute of Technology Roorkee,
Roorkee-247 667

Joint Editor**Er. Omkar Singh**

Scientist F,
National Institute of Hydrology,
Roorkee-247 667

Editorial Board

1. **Dr. Vijay P. Singh**, Professor, Texas A&M University, U.S.A.
2. **Dr. B.C. Mal**, Vice Chancellor, CSVTU, Bhilai, Chhattisgarh
3. **Dr. S.N. Panda**, Professor, IIT Kharagpur
4. **Er. A.K. Bajaj**, Ex-Chairman, Central Water Commission, New Delhi
5. **Dr. T.I. Eldho**, Professor, Dept. of Civil Engg., IIT Bombay, Mumbai
6. **Er. Raj Deva Singh**, Ex-Director, National Institute of Hydrology, Roorkee
7. **Dr. Yutaka Mastuno**, Kinki University, Nara, Japan
8. **Er. D.P. Goyal**, Managing Director, Jaypee Karcham Hydro Crp., Noida
9. **Er. S.M. Dhiman**, Member (Retd.), CEA, New Delhi
10. **Dr. P.P. Dabral**, Professor, NERIST, Nirjuli, Itanagar

IWRS as a body accepts no responsibility for the statements made by the individuals/authors

Further, views expressed by authors need not necessary be the views of the organisation to which they belong.

Reprints of any portion of this publication may be made, provided that reference thereto is quoted.

The Journal is for private circulation only.

Principal Office at:

**Deptt. of Water Resources
Development & Management
Indian Institute of Technology Roorkee
ROORKEE - 247 667
Uttarakhand, India**

MESSAGE FROM GUEST EDITOR'S

The current issue (Vol. 37, Number 4, Oct. 2017) of IWRS Journal shares the findings of the researches with all its esteemed members, broadly covering research papers related to rainfall-runoff estimation, water availability, water quality, urban runoff treatment, performance of canal irrigation, modelling of hydraulic conductivity etc.



The papers included in this issue present studies of (i) success and failure of crop pattern in Silchar (Assam) employing the decadal rainfall pattern of years 2003-2012; (ii) COD removal using alginate beads with entrapped activated carbon from wastewater; (iii) irrigation performance assessment of a canal irrigated area in Samrakalwana village (Allahabad, U.P.); (iv) stream flow measurement of Beas river basin up to Bhuntar (H.P.) using Soil and Water Assessment Tool (SWAT); (v) machine learning approaches, i.e. Multi-linear Regression (MLR), Support Vector Machine (SVM) and Gaussian Process (GP) regression of the unsaturated hydraulic conductivity of soil; (vi) WEAP-21 (Water Evaluation and Planning) model for water allocation in upper Chambal sub basin (upstream of Gandhi Sagar Reservoir, M.P.); (vii) jar tests based on ballasted sand flocculation (BSF) process to evaluate the treatment strategy for 1 MLD pilot plant installed in hilly catchment (Nainital) for urban runoff treatment.

As can be seen that the papers largely deal with the field problems/practices, and therefore, these would be useful to its members and all other stakeholders working in the area of water sector. Through this editorial, we also request the authors and its esteemed members to submit their research findings related to all fields of water resources development and management including water resources, hydropower, construction planning and management, irrigation water management, water governance, rehabilitation, environmental, socio-economic or any other aspect dealing with water in any form. Involvement of such broad issues would certainly signify the name of the journal of IWRS.

(S.K. Mishra)

Journal of Indian Water Resources Society

Volume 37

Number 4

October, 2017

CONTENTS

	Page
1. Decadal Rainfall and Probabilistic Estimation of One Day Maximum Rainfall of Silchar, Assam Diplina Paul and L. N. Sethi	1
2. Adsorption Study for Chemical Oxygen Demand Removal from Aqueous Solutions using Alginate Beads with Entrapped Activated Carbon Soha A. Abdel Gawad , Mohamed S. Morsi , Hossam and M. Abdel Aziz	8
3. Irrigation Performance Assessment of A Canal Irrigated Area: A Case Study of Samrakalwana Village in Allahabad Z. Renthlei, Denis. M. D., Kumar R., Kumar M., Srivastava, S. Denis A. Suryavanshi S. and Yadav A.	17
4. Hydrological Stream flow Modeling in Himalayan Basin under Climate Change Chanchal, S.K. Jain, Vikash Shivhare and Neha Jain	25
5. Modeling of Unsaturated Hydraulic Conductivity of Soil Parveen Sihag, N.K. Tiwari and Subodh Ranjan	38
6. A Critical Study of Water Availability and Water use in Upper Chambal Sub Basin in Madhya Pradesh Mukesh Kumar Chuahan and R.K. Shrivastava	47
7. Optimization of Ballasted Sand Flocculation Process for Urban Runoff Treatment Sumant Kumar, Absar Ahmad Kazmi, Narayan Chandra Ghosh and Rajesh Singh	56

Journal Article:

Rao, S.S., 1979. "Flood Control Regulation of Reservoirs", Journal of Indian Water Resources Society, 11(2), 19-26

Chapter in Book or Paper in a Proceedings:

Singhal, S.P. and Kasliwal, R., 1991. Calibration of Conceptual Catchment Models, in Applied Water Resourcing Planning, P.V. Narasimha (Editor). Tata Mc Graw Hill Publishing Co. New Delhi.

Reference to unpublished work should not be listed. Papers approved for publication can be listed. In doubt, see recent of IWRS Journal to locate appropriate Styles.

Tables:

Tables should be carefully prepared and should be used to replace text, not duplicate it. They should be numbered consecutively and should have a brief descriptive title. Tables should be placed in the main text.

Figures:

Each figure should have a title and be numbered. The figure will be placed in the paper as soon as possible after it is first mentioned in the text. The authors should take care to provide good quality figures that can be sent directly for printing or that can be reduced to fit into journal's one-column or two-column format. The original figures should be sent with the final manuscript. Figures should not be larger than twice paper size. Please send only black & white figures. No colour figures would be accepted.

Appendices:

All appendices must have a title (for example Appendix 1 : Description of the Model). The Appendices are to be placed after all Reference section.

Mathematical Symbols:

Avoid using the mathematical symbols that are difficult to read. If the length of an equation is likely to exceed one-column width (8 cm), break the equation appropriately. Try not to make the paper too mathematical.

Please visit www.iwrs.org.in for membership application form and previous issues of the IWRS Journal.

JOURNAL RECEIPT FORM

Dear Fellows/Members,

It is to bring to your notice that many copies of journals are coming back to us undelivered because the address of the recipient has changed. This is causing heavy financial loss on account of postage charges and yet the journal does not reach to the members. Therefore you are requested to fill up the Journal receipt form and send the same to Secretary, IWRS, Deptt. of Water Resources Development and Management, Indian Institute of Technology Roorkee, Roorkee-247 667 or E-mail at secretaryiwrs@gmail.com

1. Name (Capital)
2. Life Membership/Fellowship No.
3. Would you like to continue to receive the journal
4. Postel Address
5. Telephone/Mob.
6. E-mail

Signature of Member/Fellow

INDIAN WATER RESOURCES SOCIETY

PAST PRESIDENTS

- Sri. R. Ghosh**, Former Chairman, CWC, New Delhi 1980-82, 1990-92
Sri. Pritam Singh, Former Chairman, CWC, New Delhi 1982-84
Sr. J.F. Mistry, Former Secretary, Gujarat Irrigation Department, 1984-86
Dr. Mahesh Verma, Former Professor & Head, WRDTC, UOR, Roorkee, 1986-88
Dr. M.A. Chitale, Former Secretary, MOWR, G.O.I., New Delhi, 1988-90
Sri A.B. Joshi, Former Chairman, CWC, New Delhi, 1993-95
Dr. M.S. Reddy, Former Secretary, MOWR, GOI, New Delhi, 1995-97, 1997-99
Sri Z. Hasan, Former Secretary, MOWR, GOI, New Delhi, 1999-2001
Sri A.K. Goswami, Former Secretary, MOWR, GOI, New Delhi, 2001-05
Er. M. Gopalakrishnan, Former Secretary General, ICID, New Delhi, 2005-09
Er. A.K. Bajaj, Former Chairman, CWC, New Delhi, 2009-2011
Er. R.C. Jha, Former Chairman, CWC, New Delhi, 2011-13

EXECUTIVE COMMITTEE 2015-2017

President	- Er. A.B. Pandya	Members	Dr. Mahesh Kumar Jat
Executive Vice-President (HQ)	- Dr. S.K. Mishra	Er. R.K. Sinha	Er. S.K. Kumar
Vice President (Executive Office)	- Er. R.K. Gupta	Sri. Sudhir B. Nimbalkar	Er. Madhu Chandra Jain
Vice President	- Dr. B.R.K. Pillai	Er. R.K. Jain	Dr. R.P. Pandey
Secretary	- Dr. Ashish Pandey	Sri. Som Dutt Gupta	Prof. Gopal Chauhan
Joint Secretary	- Shri D.P. Maturia	Dr. D.G. Regulwar	
Treasurer	- Dr. P.K. Jha	Er. Vijai Bhanu Singh	Co-opted Members
Joint Treasurer	- Shri Shiv Sunder Singh	Er. Jagdish Mohan	Shri S.K. Gangwar
Editor	- Dr. S.K. Mishra	Sri. Prabhat K. Chaurasia	Shri G.L. Bansal
Joint Editor	- Er. Omkar Singh Er. Ravi Bhushan	Sr. Abhay Kumar Jain	Shri S.K. Shukla
		Sri Vivek Bhatt	Shri R.C. Jha

ACTIVE LOCAL CENTRES

Centre	Chairman	Convenor
Ahmednagar	Sri. M.S. Mundhe	Sri. A.S. Garudkar
Aurangabad	Dr. D.G. Regulwar	Er. A.M. Nimbhore
Bangalore	Sri. D. Satya Murty	Sri. Rajan Nair
Chennai	Sri. G. Ganapthi Subramanian	Sri R. Subramanian
Delhi	Er. R.K. Gupta	
Guwahati	Er. Ratul Sharma	Er. P.P. Changkakati
Kolkata	Sri. Parvin Bose	Sri. S. Patra
Lucknow	Sri. Jagdish Mohan	Er. Ravindra Kumar
Meerut	Er. S.K. Kumar	Mr. Vijendra Kumar Tyagi
Mumbai	Er. Sainathraja Dhyaksha	Er. Sudhir Nimbalkar
Nagpur	Er. Sanjay Wankhade	Er. Pravin Mahajan
Patna	Prof. Santosh Kumar	Ms. Arti Sinha
Pune	Sri S.G. Shirke	Sri. R.K. Suryawanshi
Roorkee	Er. R.D. Singh	Dr. R.P. Pandey
Shimla	Er. C.P. Mahajan	Er. C.M. Walia

Printed & Published by **Dr. Ashish Pandey, Secretary, IWRS** on behalf of the Indian Water Resources Society.
 Department of Water Resources Development & Management, Indian Institute of Technology, Roorkee - 247 667 (U.K.) India
 Telephone : Office PBX (01332-285872, 286690)
Printed at : **Paramount Offset Printers**, Roorkee Ph: 01332-261778, 9997311778, email: paraprint234@gmail.com
Secretary : E-mail: secretaryiwrs@gmail.com
Editor : E-mail: editor.iwrs@gmail.com
 URL : www.iwrs.org.in; www.iwrs.in

National Price for individual members Rs. 20/-