JALVIGYAN SAMEEKSHA (HYDROLOGY REVIEW)

Theme Hydrological Aspects of Large Scale Water Transfer



Publication of Indian National Committee on Hydrology (INCOH) (IHP National Committee of India for UNESCO) National Institute of Hydrology, Roorkee 247667 (India)

INDIAN NATIONAL COMMITTEE ON HYDROLOGY (INCOH)

(IHP National Committee of India for UNESCO)

Constituted by the Ministry of Water Resources in 1982

INCOH Secretariat

Member Secretary, Indian National Committee on Hydrology (INCOH)

National Institute of Hydrology, Roorkee – 247667, INDIA

Phone: +91 1332 272906 Ext. 299

Fax: +91 1332 272123 E-mail: incoh@nih.ernet.in Web: www.nih.ernet.in

Activities of INCOH

Sponsorship of Research/Applied Projects

INCOH provides sponsorship to research and development projects to fulfil its following objectives:

- To conduct studies and research using available technology.
- To develop new technology and methodologies for application to real life problems.
- To develop hydrological instruments indigenously and to evaluate new techniques.
- To develop new software for application in field hydrological problems.
- To give impetus to hydrological education and training.

About 48 research projects from different parts of the country have been sponsored uptil now. The funding for various projects has been provided under the following ten broad areas:

- ➤ Hydrology of surface water (rivers, lakes and reservoirs) including snow and glaciers.
- > Remote sensing applications to hydrology and water resources.
- > Hydrological information system and computers in hydrology.
- > Hydrological instrumentation and telemetry.
- > Environmental hydrology,
- > Hydrometeorlogical aspects of water resources development and flood forecasting.
- > Groundwater, springs, conjunctive use, drainage and water re-use.
- > Drought, water conservation and evaporation control.
- > Nuclear applications in hydrology.
- > Education and training in hydrology.

Organisation of National Symposium on Hydrology

INCOH organises at least one national seminar/symposium every year to bring together hydrologists and water resources engineers from various parts of India. Since 1987, INCOH has been organising such National Seminars every year on specific focal themes.

Sponsorship of Seminar/Symposia/Conferences/Short-Term Courses

INCOH provides sponsorship to various agencies and organizations for organising national, regional and international events in hydrology.

JALVIGYAN SAMEEKSHA (HYDROLOGY REVIEW)

Theme
Hydrological Aspects of Large Scale
Water Transfer

Editors

Anupma Sharma & Archana Sarkar

National Institute of Hydrology, Roorkee



Publication of
Indian National Committee on Hydrology (INCOH)
(IHP National Committee of India for UNESCO)
National Institute of Hydrology, Roorkee 247667 (India)

INDIAN NATIONAL COMMITTEE ON HYDROLOGY (INCOH) (IHP National Committee of India for UNESCO)

Chairman

Mr. R. Jeyaseelan

Chairman, Central Water Commission, New Delhi

Executive Member

Dr. K.D. Sharma

Director, National Institute of Hydrology, Roorkee

Member Secretary

Dr. Ramakar Jha

Scientist-E1, National Institute of Hydrology, Roorkee

SUB-COMMITTEES OF INCOH

STEERING COMMITTEE

Chairman

1. Member (D&R), Central Water Commission, New Delhi.

Members

Director, National Institute of Hydrology, Roorkee.
 Chairman, Central Ground Water Board, Faridabad.

4. Chief Engineer (HSO), Central Water Commission, New Delhi.5. Director (R&D), Ministry of Water Resources, New Delhi.

Secretary

6. Dr. Ramakar Jha, Sc. E1, National Institute of Hydrology, Roorkee.

RESEARCH COMMITTEE (SURFACE WATER)

Chairman

1. Director, National Institute of Hydrology, Roorkee.

Members

2. Director, Centre for Water Resources Studies, National Institute of

Technology, Patna.

3. Chief Engineer (Dam Design), Irrigation Design Organisation, Roorkee.4. Director (Hydrology - DSR), Central Water Commission, New Delhi.

5. Director, R&D Dte., Ministry of Water Resources, CWC, New Delhi.

6. Chief Engineer (Surface Water), Irrigation Dept., Bangalore.

7. Representative of DG, IMD, New Delhi.

8. Director, GERI, Baroda, Gujarat.

Secretary

9. Dr. S.K. Jain, Sc. F, National Institute of Hydrology, Roorkee.

RESEARCH COMMITTEE (GROUND WATER)

Chairman Members 1. Member (SML), Central Ground Water Board, Faridabad.

2. Director (R&D), Ministry of Water Resources, New Delhi.

3. Joint Director, CWPRS, Pune.

4. Prof. B.B.S. Singhal, Emeritus Professor, IIT Roorkee, Roorkee.

5. Director, NGRI, New Delhi.

6. Dr. G.D. Gupta, Advisor, DST, New Delhi.

7. Chief Engineer (Ground Water), Irrigation Department, Hyderabad. 8. Dr. Ramakar Jha, Sc. E1, National Institute of Hydrology, Roorkee.

Secretary

9. Mr. R.C. Jain, Sc. D, Central Ground Water Board, New Delhi.

JALVIGYAN SAMEEKSHA

(HYDROLOGY REVIEW)

Volume 19, Number 1-2, 2004

THEME: HYDROLOGICAL ASPECTS OF LARGE SCALE WATER TRANSFER

CONTENTS

| Teci | hnical | Pa | pers |
|------|--------|----|------|
| | | | |

| Large Scale Surface Water Transfer – Hydrological and Other Issues S.K. Sinha and R. Jeyaseelan | 1 |
|--|-----|
| Groundwater Aspects of Inter-Basin Water Transfer Deepak Kashyap | 17 |
| Systems Techniques for Planning Inter-Basin Water Transfers P. P. Mujumdar and Subimal Ghosh | 21 |
| Water Rights in Indian Transboundary Watercourses A.K. Gosain and A. Singh | 41 |
| Decision Making for Conjunctive Water Use Planning in Inter-Basin Transfer Framework Ashok K . Keshari | 53 |
| Models for Water Resources Assessment and Reservoir Operation Simulation in a Multi-Basin System M.K. Goel, S.K. Jain, Vijay Kumar and A. Sharma | 73 |
| Dynamics of Inter-Basin Water Transfer: Lessons from Sardar Sarovar Narmada Project S.K. Gupta and M. Dinesh Kumar | 89 |
| Water Balance Analysis for Large Scale Water Transfer – A Case Study M.L. Kansal | 105 |
| INCOH Sponsored Research Projects | 117 |

