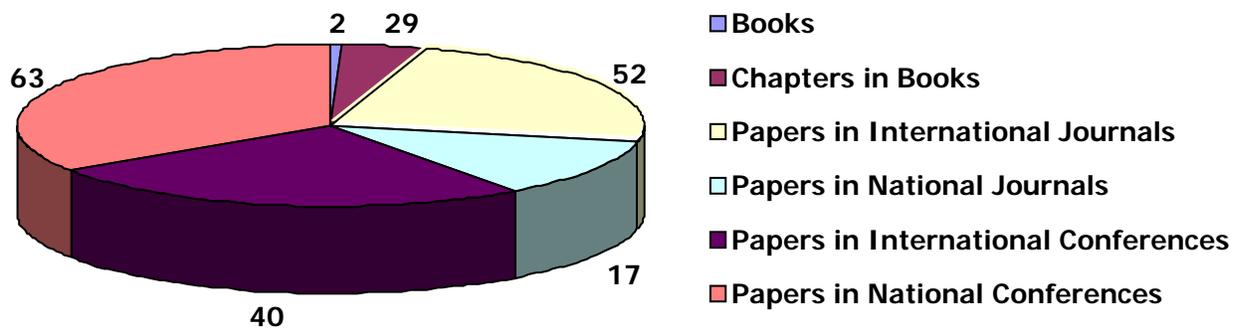


Chapter – 5

PUBLICATIONS AND TECHNOLOGY TRANSFER

A. Publications

During the year 2008-09, a number of publications in different forms were brought out by the Institute and the same is presented below. The list of



publications is given in Appendix-IX.

B. Technology Transfer

Technology transfer activities form an important component of the Institute's activities besides publication and circulation of reports of studies and research. The Institute has been organizing short duration workshops dealing with specialized areas in hydrology for transfer of relevant theoretical background as well as methodologies including computer programs to field engineers of Central and State Government Organisations in the country.

During the year 2008-09, following training courses and workshops were organized:

S N	Topic	Period	Venue	No. of Trainees/p articipants
1.	Brain Storming Session on Impact of Climate Change on Water Resources and Adaptation Strategies	April 23-24, 2008	CSMRS, New Delhi	105
2.	Training Course on Remote Sensing and GIS applications in water resources management (* for BBMB under HP- II)	May 6-8, 2008	Roorkee	17
3.	Training course on Surface Water Data Processing and validation Using SWDES (*under Hydrology Project II)	June 9-13, 2008	Shimla	32
4.	Training Workshop on Mountain Hydrology (organized in collaboration with DST)	June 9-20, 2008	Agri. Univ. Junagarh, Gujarat	40
5.	Training Course on “Water Quality and its Management” in the collaboration with Central Soil and Materials Research Station (CSMRS), New Delhi.	July 7-11, 2008	CSMRS, New Delhi	35
6.	Trining Course on Applications of Remote Sensing and GIS in Water Resources Management	July 8-10, 2008	NIH, Patna	30
7.	Brain Storming Session on Isotope Fingerprinting of waters of India (Organised under IWIN project)	July 14-15, 2008	Rookee	32
8.	Training course on Surface Water Data Processing and validation using SWDES & HYMOS (*under Hydrology Project II)	July 21 - 25, 2008	Chennai	31
9.	Thirteen National Symposium on Hydrology with Focal Theme on inflow Forecasting During Extremes	August 28-29, 2008	Delhi	
10.	National Seminar on “Conservation and Restoration of Lakes (CAROL-08)” in collaboration with National Environmental Engineering Research Institute (NEERI), Nagpur.	October 16-17, 2008	NEERI, Nagpur	103
11.	Training Course on remote Sensing and GIS applications in water resources management (*under Hydrology Project II)	October 20-24, 2008	Roorkee	25
12.	Training workshop on Data Processing and validation using SWDES and HYMOS (*under Hydrology Project II)	November 17 - 21, 2008	Goa	24
13.	Mathematical Modeling of River Flows	December 10-24, 2008	NIH, Patna	22

14.	Training course on Emerging trends in the groundwater management with special reference to the coastal groundwater management (* under Hydrology Project II)	December 15-19, 2008	NIH, Kakinada	20
15.	International Conference On Water, Environment, Energy And Society (WEES) – 2009	January 12-16, 2009	New Delhi	
16.	Training Course on Water Quality Assessment and Management (* under Hydrology Project II)	February 2-6, 2009	NIH, Belgaum	30
17.	Inception Workshop on DSS (Planning) for Integrated Water Resources Development and Management (* under Hydrology Project II)	February 9-10, 2009	New Delhi	32
18.	Remote Sensing and GIS applications in water resources management (*Organised for Govt. of Rajasthan)	February 23 – 6 March, 2009	Roorkee	18
19.	Training course on Project Hydrology (* under Hydrology Project II)	March 23–29, 2009	Anand, Gujarat	29

1. International Conference On Water, Environment, Energy And Society (WEES–2009), held at New Delhi during January 12-16, 2009

On behalf of Ministry of Water Resources, Govt. of India, National Institute of Hydrology, Roorkee organized an International Conference on “Water, Environment, Energy and Society (WEES) – 2009” during January 12-16, 2009 at New Delhi. The Conference was inaugurated by Shri Saifuddin Soz honorable Union Minister for Water Resources on January 12, 2009. The main themes of the Conference were water and environment, water hazards, water for energy, water for other uses, water for society, etc. Around 400 research papers on above topics had been received by the Conference Secretariat at National Institute of Hydrology, Roorkee. The papers were presented in 36 technical sessions on various topics which include Rainfall, Infiltration & Evapotranspiration, Surface Runoff, Snow and Glacier Hydrology, Ground Water, Watershed Modeling, Statistical Analysis, Flood Management, Drought Management, Water Distribution Systems, Uncertainty Analysis, Systems Analysis Techniques, Reservoir Regulation, Decision Support System, Water Quality Analysis, Surface Water Quality, Sub Surface and Ground Water Quality, Pollution Control and Management, Social & Environmental Aspects, Water & Energy, Erosion & Sedimentation, Irrigation Management, Watershed Management, Water Resources Management, Remote Sensing & GIS applications and Climate Change.



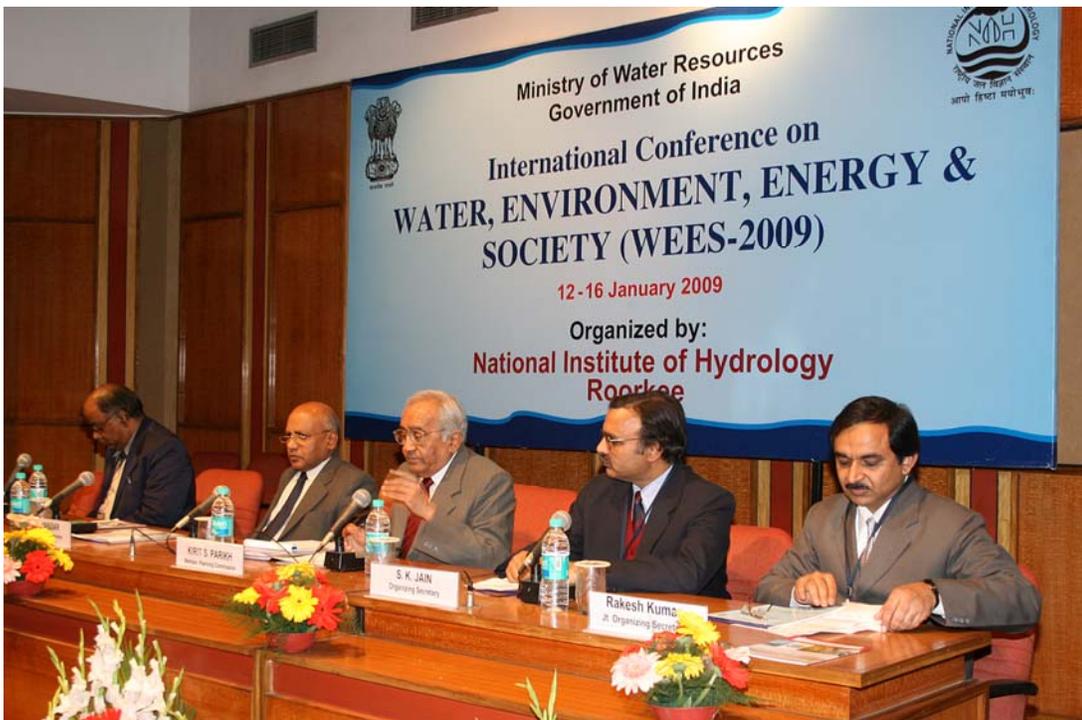
Dignitaries at dais on the occasion of the International Conference on Water, Environment, Energy and Society (WEES-2009)



Prof. Saifuddin Soz, Hon'ble Union Minister for Water Resources, Govt of India releasing the Proceedings of the International Conference on Water, Environment, Energy and Society (WEES-2009)



A view of the participants attending the technical session of the International Conference on Water, Environment, Energy and Society (WEES-2009)



A view of the valedictory function of the International Conference on Water, Environment, Energy and Society (WEES-2009)

The recommendations are as follows:

1. The existing hydro-meteorological data networks need to be strengthened through the establishment of state-of-art equipment. Web-enabled data base management systems for data archiving, storage, and retrieval need to be developed by employing advanced information technology.
2. There is a need to carry out integrated planning and management at basin level with appropriate decision support system for optimal utilization of water resources through multipurpose projects including irrigation, flood control, hydro-power, drinking water supply etc. Inter-basin water transfer schemes wherever needed, may be encouraged.
3. Rainwater harvesting and creation of storages should be encouraged for augmentation of water resources in water stressed areas.
4. Improved flood forecasting systems are required to be developed and implemented for mitigation and management of floods. Flood hazard modeling, flood plain management and dissemination of warning should be integrated into flood management programs.
5. Micro irrigation methods such as drip and sprinkler systems should be encouraged. This should include education, awareness of stake holders.
6. There is need to better understand the climate change effects on the water availability and demand and to adapt the design and management practices which can mitigate the effects of climate change on the energy and food security.
7. As the various components of hydrological cycle are getting affected by land use changes and anthropogenic influence due to developmental activities, models capable of taking into consideration such changes need to be applied to predict the hydrological response of the catchments.
8. Monitoring of snow and glaciers in the high altitude regions needs to be enhanced by the use of appropriate technology. Hydrological modeling may be encouraged for estimation of snow and glacier melt contributions in the flow of snow fed river systems.
9. Application of isotopic techniques to understand and quantify the various hydrological processes need to be promoted and these may be applied to estimate the snow /glacier melt, rainfall and ground water contributions in rivers. Results of isotopic techniques need to be validated with those from the hydrological models and field data.
10. Drought vulnerability indices should be developed for different agro-climatic regions for drought mitigation and management. Measures

should be taken to increase supply and reduce demand of water in drought prone areas.

11. For optimal ground water development, advanced modeling approaches coupled with judicious management need to be followed.
12. Geo-hydrological survey should be conducted to detect change in quality of surface as well as ground water resources. Quality of all sources of water should be preserved by better regulation and enforcement to protect human health and eco-systems.
13. Appropriate low cost treatment techniques for removal of geogenic and anthropogenic origin pollutants need to be evolved at community level. Best management practices and judicious use of resources would be necessary to solve problems related to soil and water quality degradation.
14. High concentration of pesticides and other non-biodegradable substances are being detected in sources of water. Movement of pollutants needs to be modeled for the purpose of planning and decision making.
15. There is a need to improve the existing methodologies of hydrological modeling using advanced models as well as soft computing techniques such as ANN, Fuzzy logic, Genetic algorithm, machine learning methods, etc.
16. There is a need to develop and apply process-based models considering the processes of detachment, erosion and transportation of sediment to estimate sediment yield and to quantify the impact of rainfall and vegetation characteristics on sediment detachment and transport.
17. Traditional and local perceptions/ knowledge should serve as links between society and environment, and science and engineering such that they contribute to an improved quality of life for present and future generations.
18. There is a need to bridge the gaps between the advanced analytical techniques and their practical / field applications. To that end, manuals and handbooks for practices should be prepared for practitioners.
19. Sharing of knowledge and dissemination of technology through the participatory approach and capacity building programs utilizing the modern means of communications needs to be encouraged.
20. Sustaining the ecosystem should be a primary goal of all water resources projects both in the design and implementation phases.

2. 13th National Symposium on Hydrology with focal theme on "Inflow Forecasting During Extremes" 28-29 August, 2008, New Delhi.

Under the auspices of INCOH, 13th National Symposium on Hydrology was organized by National Institute of Hydrology, Roorkee at IIT, Delhi from 28-29 August 2008 on the focal theme "**Inflow Forecasting during Extremes**". Besides the focal theme, other related aspects of hydrology including water resources management, environmental and social aspects of water etc. were also covered during the Symposium. About 120 participants which include researchers/scientists, academicians/scholars, engineers, bureaucrats/ policy makers, planners, managers and non-governmental organizations (NGOs) attended the National Symposium.

Symposium was inaugurated by Shri A.K. Bajaj, Chairman, Central Water Commission & Chairman, INCOH on 28th August 2008. Shri Bajaj released the proceedings of abstracts of the technical papers accepted for the symposium. There were 8 technical sessions wherein about 70 research papers & key note addresses were presented. Shri Jai Prakash Narayan Yadav, Hon'ble Minister of State for Water Resources graced the occasion as Chief Guest during the valedictory function on 29th August 2008. Shri A.K. Bajaj, Chairman CWC, gave his welcome address during this function. Shri R.D. Singh, Director, National Institute of Hydrology, Roorkee presented the recommendations of the symposium during the function. These recommendations are as follows:

1. There is need to strengthen and upgrade the existing hydrometeorological and hydrological data collection network through establishment of state of art equipment/technology.
2. For Real Time Flood Forecasting, the advanced and automatic system need to be installed for efficient communication of the data from the observation sites to the forecasting station.
3. Web enabled data base management system is required to be developed for efficient processing and acquisition of data for hydrological analysis.
4. There is a need to improve upon the existing methodology of formulating the inflow forecasts using advanced distributed hydrological models as well as the soft computing techniques such as ANN, Fuzzy Logic and Genetic Algorithm.
5. Decision Support Systems are required to be developed interfacing the temporal & spatial data bases with the hydrological models for integrated water resources development and management as well as real time operation of water resources projects.
6. For separating the snow melt, glacier melt, rainfall and ground water contributions in the stream flow of Himalayan river system, nuclear techniques may be applied and the results need be validated with those obtained from the hydrological modeling techniques.

7. Non structural measures of flood management such as real time flood forecasting, real time flood hazard modeling, flood plain zoning and flood risk mapping as well as flood proofing are required to be applied for mitigation of flood damages. For this purpose, advanced tools like geographical information system and high resolution & microwave satellite as well as radar data may be utilized for producing the flood inundation maps.
8. Structural measures such as storage dams, embankments and levies etc. are being adopted for management and mitigation of the flood. There is a need to take up the simulation studies for different scenarios of the failures of such structures and prepare the disaster management plans.
9. Most of the Indian cities are facing the problem of drainage congestion. In order to improve upon the existing drainage system, analysis of short interval rainfall and storm water management modeling may be taken up.
10. Suitable methodologies need to be developed for formulating the accurate inflow forecasts for integrated multi-purpose reservoir systems for their optimal operation, particularly during the period of hydrological extremes.
11. To preserve the water resources, environment and ecosystem, there is a need for taking up regular monitoring of water quality parameters of various water sources. The water quality modeling studies need to be taken up to study the impact of point and non-point sources of pollution on the quality of the water bodies.
12. Aquifers play an important role during both types of hydrological extremes viz., floods and droughts by moderating the impact of hydrological disasters. Therefore, precise estimation of groundwater potential of an area requires due attention. All advanced techniques should be employed for ensuring accuracy and reliability in the estimation of ground water resources.
13. Hydrologic design aids for managing ground water supply and demand should be considered for promoting standardization of design procedures as well as management and modeling approaches for groundwater.
14. Threats to ground water quality due to anthropogenic activities and geogenic sources are emerging as major concerns. Due attention needs to be given in combating the threat to ground water quality.
15. Studies need to be taken up to predict the possible impacts of climate change on the water resources for evolving the adaptation strategies to

cope up with the resulting water problems. The various issues raised in the National Action Plan on climate change released by the Hon'ble Prime Minister should be duly addressed in such studies.

16. Well trained and dedicated manpower is needed for formulating and disseminating the real time flood forecast at the forecasting site. Capacity building programmes are required for disseminating the advanced methodologies to the users which could be further refined based on feedback from user agencies.
17. There is a need for close coordination within the government organizations and with research/academic organizations for the development of better forecasting techniques and their implementation on ground.



Shri A K Bajaj, Chairman, Central Water Commission, releasing the abstract volume of the 13th National Symposium on Hydrology at New Delhi



Shri A K Bajaj, Chairman, Central Water Commission, presenting the inaugural address during the 13th National Symposium on Hydrology at New Delhi



Shri Jai Prakash Narayan Yadav, Hon'ble Minister of State for Water Resources, presenting the valedictory address during the 13th National Symposium on Hydrology at New Delhi



Shri R D Singh, Director, National Institute of Hydrology addressing the participants during the 13th National Symposium on Hydrology at New Delhi