

Chapter – 2

ORGANISATIONAL STRUCTURE

Society

The National Institute of Hydrology Society is the apex body of the Institute and meets at least once a year. It reviews the progress and performance of the Institute and gives such directions as it may deem fit to the Governing Body and the Institute towards the attainment of the objectives enunciated in the Memorandum of Association of the Society. Ten Ministers in Charge of Irrigation and Water Resources in the States and ten eminent engineers, water resources experts are nominated by the President of the Society for a three years term. The membership of the Society as on March 31, 2009 is given in Appendix-I.

The 29th Annual General Meeting of the Society was held at New Delhi under the Chairmanship of the Union Minister for Water Resources & President of the Society on March 4, 2009. The Society considered the Annual Report and audited statement of accounts of the Institute for the year 2007-2008 and reviewed the work carried out by the Institute during 2008-2009. The annual report and audited accounts for the year 2007-2008 and the budget for the year 2009-2010 were approved.

Governing Body

The Governing Body (GB) under the Chairmanship of the Secretary, Ministry of Water Resources, Government of India is the executive body of the Institute and is responsible to pursue and carry out the activities as per objectives laid down by the Society. The Governing Body exercises all executive and financial powers of the Society. The Governing Body is expected to meet at least twice in a financial year. The constitution of the Governing Body as on March 31, 2009 is given in Appendix-II.

During the year 2008-2009, the 69th meeting of the Governing Body was held at New Delhi on January 9, 2009. Several decisions relating to administrative and financial matters of the Institute were taken in the meeting. Annual report and audited accounts of the Institute for the year 2007-2008 were considered by the Governing Body and recommended for approval. The revised budget for 2008-2009 and budget proposals for 2009-2010 were also considered and recommended for consideration of the Society.

Standing Committee

The Governing Body has constituted a Standing Committee under the Chairmanship of the Additional Secretary (Water Resources), Government of India, to consider the financial and administrative matters pertaining to the Institute. The Standing Committee has the powers to consider the matters referred to it by the Governing Body on behalf of the Governing Body and the decisions of the Committee are reported to the Governing Body for its approval. The constitution of the Standing Committee is given in Appendix-III.

Coordination Committee

To ensure effective coordination between the Institute and the Indian Institute of Technology, Roorkee, a Coordination Committee has been constituted under the Chairmanship of Director, Indian Institute of Technology, Roorkee. This committee, besides ensuring effective coordination, also recommends the ways for increasing interaction between the two organisations so that the facilities and expertise of both organisations is optimally utilized.

Technical Advisory Committee

The Technical Advisory Committee (TAC) under the Chairmanship of the Chairman, Central Water Commission, New Delhi carries out technical scrutiny of the research program of the Institute and recommends priority areas for studies and research. It is also responsible for carrying out technical scrutiny of the plans drawn up for five years and the individual schemes submitted for external assistance and expansion of the Institute. The constitution of TAC is given in Appendix-IV.

The 59th meeting of the TAC was held on November 11, 2008 at Delhi. During the meeting, the TAC reviewed the progress of studies and research for the year 2008-2009.

As desired by the Technical Advisory Committee (TAC) of the National Institute of Hydrology, a Status Report on "Irrigation Practices in India and Options for More Crop and Income per Drop of Water" was also prepared during the year 2008-09.

Working Groups

The Governing Body of the Institute has constituted three Working Groups under the Chairmanship of the Director, NIH to consider and to recommend to TAC on the program of studies to be taken up by the various Scientific Divisions of the Institute and review the progress of work. Experts in specialized fields from various field organisations both from Central and State Governments and academic and research institutions are members of the Working Groups. The members of the Working Group are drawn from various Central and State Governments' Organisations, Universities and individual experts working in the

field of hydrology and water resources. The constitutions of the Working Groups are given in Appendix-V. The reports prepared by the Divisions in various areas of hydrology are sent to the concerned members of the Working Group and other experts for their comments and suggestions.

The 29th Joint Working Group meeting was held on September 30-October 1, 2008 at NIH, Roorkee.

Scientific Divisions

Studies and research activities at the headquarters are carried out under the following five scientific Divisions. The divisions have undertaken various consultancy and sponsored research projects. As part of the technology transfer program of the Institute, various training courses/workshops have also been organized by the divisions:

1. Ground Water Hydrology

The Ground Water Hydrology division is actively pursuing the basic and applied research pertaining to various aspects of ground water hydrology. It includes aquifer parameter estimation, design of sub-surface drainage, stream-aquifer interaction, groundwater assessment, modeling and management, coastal groundwater dynamics, contaminant transport modelling, management of aquifer recharge and impact of climate change on groundwater resources.

The division is actively participating in the activities of Hydrology Project, Phase-II including development of Decision Support System (Planning) and Purpose Driven Studies.

2. Hydrological Investigations

The Hydrological Investigations Division is actively engaged in conducting field and laboratory based research related to the various hydrological investigations using conventional and isotopic techniques and hydrological instrumentation. The Division is involved in a number of national projects related to the watershed management, hydrograph separation of rivers, surface water and groundwater interaction, isotopic signatures of groundwater, rivers, precipitation and air moisture in different parts of the country. The Division also has two laboratories attached to it:

- Nuclear Hydrology Laboratory and
- Hydrological Instrumentation Laboratory

The Division is participating in a mega multi-institutional project on isotope finger printing of waters in India where 14 different academic, state and central government field and R & D organizations are involved. The Division has also been awarded two purpose driven studies under hydrology project, Phase- II.

3. Surface Water Hydrology

The Surface Water Hydrology Division is actively pursuing the basic and applied research pertaining to various aspects of Surface Water Hydrology. It includes hydrology of extremes i.e. floods and droughts, flood forecasting, project hydrology, sedimentation modeling, monitoring and modeling of snow and glacier melt, watershed modeling, impact of climate change on water resources, applications of soft computing techniques in hydrology etc.

The Surface Water Hydrology Division has a Soil and Ground Water Laboratory which is well equipped with state of the art equipments to study soil moisture, particle size, infiltration rate and other soil characteristics.

The division is actively coordinating the activities of Hydrology Projects Phase-II. The Scientists of the division are also involved in the development of DSS (P) and Purpose Driven Studies under HP-II.

4. Water Resources Systems

The Water Resources System Division is actively pursuing the basic and applied research pertaining to various aspects of water resources planning and management. It includes rainfall-runoff modeling, reservoir operation and sedimentation, application of remote sensing, GIS and ANN technology in hydrological studies. In the division, software are also being developed and refined for reservoir operation, river basin planning and management, and web-enabled hydrological information at the basin/sub-basin scale.

The Water Resources Division has a remote sensing and GIS laboratory which is well equipped with advanced state-of-the-art software and remote sensing data to study the various aspects of hydrology by using remote sensing and ancillary data.

The division is actively participating in the activities of Hydrology Project – II. The Scientists of the division are also involved in the development of DSS (P) and purpose driven studies of HP-II.

5. Environmental Hydrology

Water quantity and quality processes constitute an integral part of the natural hydrologic environment and both required for proper assessment, development and management of water resources. Water quality issues are critical in terms of pollution control and environmental management. These

issues are being critical in determining the amount of available water that can be used to meet specific water demand for sustainable development. In view of above, the institute has environmental hydrology division mainly to undertake, aid, promote and coordinate basic, applied and strategic research in the area of environmental hydrology contributing to sustainable water resources development in the country. The main thrust areas of research in environmental hydrology division include:

- Surface & ground water quality monitoring and modeling for human health,
- Natural and organic contaminants transport modeling,
- Integrated hydrological studies of lake ecosystems,
- Erosion and sedimentation studies,
- Water logging and salinity in command areas,
- Point and Non-point source pollution,
- Low cost treatment/remedial technologies,
- Environmental impact assessment studies,
- Environmental flow requirement studies.

The Environmental Hydrology Division has a Water Quality Laboratory, which is well-equipped with advance state-of-the-art-equipments to identify and quantify physical, chemical and bacteriological parameters in various water bodies like rivers, lakes, reservoirs, wells, aquifers, canals etc.

Centre for Flood Management Studies and Regional Centres

In order to deal with the specific hydrological problems of different regions of the country and for providing effective interaction with the States, the Institute has established following two Centre for Flood Management Studies and four Regional Centres:

1. Centre for Flood Management Studies, Patna

The Ganga Plains North Regional Centre (GPNRC) was established in May, 1991. Realizing the importance of Flood Management Studies for Ganga Basin, the Ministry of Water Resources, Government of India restructured the GPNRC as “NIH Centre for Flood Management Studies” in June 2001. The Centre is now mainly concentrating on flood related studies of the region covering eastern Uttar Pradesh, Bihar, Jharkhand and West Bengal. Important rivers in the region originate mainly from different mountain ranges of the Himalayas. These rivers carry enormous silts as they travel through the hilly terrain and later on these silts get deposited in the river courses and over the plain lands. Shifting of river courses are reported to be a common phenomena in most of the rivers of Himalayan origin. Apart from causing floods, formation of chauris is another problem of the region. Problems of water logging and drainage congestion in most of the river basins are also of grave concern. Problems of water pollution in the river system are also aggravating the situation. Problems of surface water pollution endangering the ecological front of the river are also in the lime light.

As decided in the RCC meeting, Centre's research activities are presently concentrating on the following aspects:

- Flood estimation,
- Flood routing,
- Structural and non-structural measures of flood management,
- Application of remote sensing and geographical information system (GIS) in flood studies,
- Waterlogging and drainage congestion,
- Integrated watershed management,
- Development of hydrological database,
- Tal problems and its management,
- Field and laboratory based studies on soil properties and water quality,
- Technology transfer activities.

2. Centre for Flood Management Studies, Guwahati

The North Eastern Regional Centre (NERC), Guwahati catering for the seven N-E states, Sikkim and parts of West Bengal (Teesta basin) was established in August 1988 at Guwahati and was working for various water resources problems of the region. Since its inception, the centre has been actively interacting with the various water resources organizations in the states covered under the region while carrying out its studies and research within the framework of recommendations of the Regional Coordination Committee in the areas of representative basin studies, remote sensing application, water quality studies, floods, watershed management etc.

Considering flood as the major problem in the region, Ministry of Water Resources, Govt. of India decided to focus the activities of the centre towards the problem of floods in the Brahmaputra Basin and renamed it as NIH Centre for Flood Management Studies for the Brahmaputra Basin (NIH-CFMS). The centre was formally opened/ inaugurated on Sept. 27, 2001 by hon'ble Minister of State for Water Resources, Govt. of India and Secretary, Govt. of India, Water Resources. As per the action plan the centre has to work in the following thrust areas of research:

- Flood estimation and routing,
- Structural/non structural measures for flood management,
- Integrated watershed management for flood control,
- Hydrological data base management system,
- Drainage congestion and erosion problems,
- Water quality problems,
- Socio-economic aspect of flood disaster, and
- Technology transfer.

3. Hard Rock Regional Centre, Belgaum

Hard Rock Regional Centre, National Institute of Hydrology was established in 1987 with its office at Belgaum, Karnataka, to cater the hydrological problems associated with the hard rock area of the country. The areas covered under this regional centre include Karnataka, Goa, Kerala, Maharashtra, Tamilnadu and parts of Andhra Pradesh.

Since the establishment of the regional centre, considerable emphasis has been laid on interaction with the stakeholders and user agencies of the Central and State Governments. A Regional Coordination Committee (RCC) consisting of academics, experts and senior government officials of the user agencies meets periodically to review and advise the centre on the status of studies and research programs each year.

Over the years, scientists of this centre have taken up many studies concerning various aspects of Hydrology. Malaprabha river basin was selected as the representative basin for the hard rock region and a hydro-meteorological database was developed for the basin. Projects were taken up under the sponsorship of UNESCO, UNDP, FORD Foundation, World Bank, Pollution Control Board, DST and CWC. The results from these studies were presented in the form of NIH reports and as technical papers in journals and proceedings of conferences. The major areas in which the scientists of the centre worked are:

- Rainfall-runoff modeling,
- Rainfall distribution and statistical analyses,
- Estimation of soil hydraulic properties to assess and model the subsurface water flow,
- Surface water and groundwater quality assessment and modeling,
- Application of nuclear techniques to recharge studies,
- Irrigation return flow studies in command area,
- Analysis of hydrological aspects of drought,
- Application of remote sensing and GIS in hydrology for analysis of long term land use changes, demarcation of erosion potential zones, analysis of reservoir sedimentation, estimation of parameters for hydrological modeling, etc.,
- Evaluation of impact of afforestation/deforestation on hydrology of forested catchments.

4. Western Himalayan Regional Centre, Jammu

The Western Himalayan region of our country is marked with steep mountains, which largely influence the climate and weather conditions of north-west India and is the main source of water supply for Indus-Gangetic plains from rainfall and snow/glacial melt. The region receives rain and snow during winter and also the south-west monsoon. The River Indus (from which our country

derived its name) and the River Ganges (which is worshiped by millions in our country) originate from the Western Himalayas. Snow, glaciers, springs and high altitude lakes are the resources and reservoirs of water for remote hilly and high altitude regions. There was a strong need to carry out the hydrological studies in the region so that hydrological processes in the mountainous region could be well-understood and water resources could be managed in the optimal manner. To carry out the systematic hydrological studies in the Western Himalayan Region, NIH established a regional centre named “Western Himalayan Regional Centre” at Jammu in January, 1990. Major objective of Western Himalayan Regional Centre (WHRC) is to carry out hydrological research for the Western Himalayan Region of the country.

The States of Jammu & Kashmir, Himachal Pradesh & hilly portion of Uttarakhand constitute the jurisdiction of Centre.

Thrust Areas of Research at WHRC: The hydrological problems of the Himalayan regions are different from the plain areas due to variation in topography, geology, climate, land use, soil etc. The Western Himalayan region, in particular, faces a variety of hydrological problems which mainly include Flash floods, Water availability problems (particularly in Kandi Belt of Jammu region and upper reaches of the Himalayas), Hydrological network & information, Soil erosion & sedimentation, Deterioration of lakes, and Water quality problems. In light of the hydrological problems of the region, the thrust areas of studies and research at WHRC, Jammu include:

- Snow and Glacier melt modelling,
- Flash floods,
- Soil erosion and sedimentation in reservoirs,
- Effects of forest cutting and watershed management,
- Lake hydrology,
- Water quality studies,
- Network improvement and instrumentation, and
- Education and training.

The regional centre has developed laboratory capabilities for remote sensing and GIS applications, water quality analysis and soil analysis.

5. Deltaic Regional Centre, Kakinada

The East Coastal Deltaic regional centre was set up on 9th September 1991 in the coastal city of Kakinada, Andhra Pradesh. The jurisdiction of the regional centre extends the east coast covering partly the states of Tamilnadu, Andhra Pradesh, Orissa, West Bengal and the union territories of Pondicherry and Andaman & Nicobar Islands. The broad objectives of the center are given as:

- To address region-specific hydrological problems with applied research studies,
- Coordinate with user agencies,

- Undertake sponsored research, and
- Technology transfer through training workshops.

The hydrology of coastal and deltaic regions is greatly influenced by the hydro-dynamics of the sea, hydrogeology, monsoon rainfall and complex deltaic processes involving the deposition of river sediment over evolutionary time periods. Typical hydrological problems relevant to east coast of India are:

- Seawater intrusion in coastal aquifers and ground water management,
- Groundwater contamination from point and non point sources,
- Sedimentation of reservoirs,
- Urban Drainage congestion and inundation, and
- Flash floods from cyclonic storms and breach of tanks.

The Deltaic Regional Center is capable of analyzing major physical and Chemical parameters in the water quality laboratory and also capable of using GIS and Remote Sensing tools in hydrological studies. The center is equipped with latest software's like Matlab, Groundwater Vistas, Lindo, GMS, WMS, ERDAS, ILWIS.

6. Ganga Plains South Regional Centre, Sagar

Regional Centre Sagar named as Ganga Plains South Regional Centre (GPSRC), started its functioning from 1st Dec., 1995. Presently the office is running in a private rented building at Manorama Colony, Sagar. This Centre has been set up to carry out research studies in various aspects of hydrological problems of basins/sub-basins of north flowing rivers namely Banas, Chambal, Kalisindh, Betwa, Dhasan, Ken, Tons, Son and their tributaries, which ultimately join the Ganga River. The jurisdiction of GPSRC, Sagar covers major part of Bundelkhand and Baghelkhand regions of Central India, southern part of Uttar Pradesh and southeast Rajasthan. The hydrological research of the Regional Centre, Sagar have been categorised into five major groups:

- Rainfall-Runoff Modelling,
- Water availability studies,
- Sedimentation study using Remote sensing,
- Drought analysis,
- Watershed management, and
- Water quality studies.

Regional Coordination Committees

To ensure effective coordination between the CFMS/Regional Centre and the various academic and field organisations in the region, who are engaged in water resources research and development and to advise the CFMS/Regional Centre in all technical and scientific matters, the Society has approved constitution of Regional Coordination Committee for each CFMS/Regional

Centre. The Regional Coordination Committee also examines the proposals for diversification of activities of the Centre.

Experts from field organisations and academic Institutes of the region covered by the Regional Centre are members of the Regional Coordination Committee with Director, NIH as the Chairman. The constitution of six Regional Coordination Committees for six Regional Centres is given in Appendix-VI. The details of meetings of RCC held during 2008-09 are given below:

Meetings of Regional Coordination Committees

S. No.	Regional Centre	Date	Place of meeting
1.	Belgaum	June 26, 2008	Belgaum
2.	Jammu	April 18, 2008	Jammu
3.	Guwahati	March 19, 2008	Guwahati
4.	Kakinada	June 9, 2008	Kakinada
5.	Patna	July 11, 2008	Patna
6.	Sagar	July 4, 2008	Bhopal



The Eighth RCC meeting of Ganga Plains South Regional Centre, Sagar

Indian National Committee on Hydrology

The Indian National Committee on Hydrology (INCOH) is the apex body under the Ministry of Water Resources with the responsibility of coordinating various activities concerning hydrology in the country. These activities are devoted to encourage national and state level organizations to take up research and development works in hydrology. The Committee has its members drawn from Central and State Government Agencies as well as experts from academic and research organizations. The Committee gets a feed back from states and coordinates activities at state level through state coordinators. The involvement of state coordinators in the Committee and constitution of State Level Committees on Hydrology in various states further assist to fulfill its objectives.

The main Committee consists of senior officials from various central, state and academic organizations in the country dealing with monitoring, evaluation, analysis and utilization of water resources. The Committee has successfully fulfilled its role during the last 26 years. The Secretariat of the Committee is attached to the Institute. The constitution of the INCOH is given in Appendix-VII.

The Institute has been providing secretarial assistance to the Indian National Committee on Hydrology (INCOH). The Indian National Committee, as one of its objectives, provides technical support to the Ministry of Water Resources (MoWR) in evaluating the R&D projects and studies for funding. Till date, under INCOH, MoWR has granted financial support to 65 research projects under "Research Schemes Applied to River Valley Projects".

In pursuance of its objectives of preparing and periodically updating the state-of-the-art technology in hydrology in the country, till March 2009 the secretariat has published 29 state of the art reports on different topics. The secretariat also publishes an annual journal on hydrology entitled "Jal-Vigyan Sameeksha". The journal is being distributed to about 500 organizations in the country and abroad in order to disseminate and promote knowledge in the field of hydrology. During the year one issue of Jal Vigyan Sameeksha is being brought out on "Water resources management under drought situation".

The 6th R&D Session of INCOH was held at Thiruvananthapuram during 3-5 December 2008. The three days session was inaugurated by Sri N.K. Premachandran, Hon'ble Minister for Water Resources, Govt. of Kerala and presided over by Sri A. K. Bajaj, Chairman, INCOH & CWC, New Delhi. Seventeen Project Investigators presented their progress out of 19 research projects which was evaluated by 20 eminent experts. The valedictory function of the 6th R&D Session was chaired by Sri K. Jayakumar, Additional Chief Secretary, Govt. of Kerala.

The INCOH provides funding on priority areas approved by Ministry of Water Resources such as Climate Change, Drought, Artificial Ground Water Recharge etc. During the year the INCOH has funded nine international as well as national seminars, symposia, workshops and conferences in the areas of hydrology and water resources development. One of the major aims of the INCOH

is to effectively coordinate and act as the focal point for the international Hydrological Programme (IHP) of UNESCO. The Committee has been involved in the VII phase of IHP (2008-2013) of UNESCO, which is devoted to water interaction with various systems emphasizing the need to solve social changes ahead and associated risks.