NATIONAL HYDROLOGY PROJECT

CONNECT

(Special Issue July - December 2018 | News Letter)
Dear Colleagues,

Water is an important natural resource which touches all segments of society as well as economic sectors. Conflicting demands coupled with population growth, rapid urbanization, industrialization, expansion of agriculture, tourism & climate change, all put water under increasing stress. The pressure on water resources highlights the need of adopting suitable measures for managing water resources in a sustainable manner. With the impact of climate change becoming more pronounced, the management of water resources further assumes greater significance.

Under National Hydrology Project, an effort has been made to take up these issues at the national level as well as state level. Densification of real time data acquisition system, development of common national water resources data base, revamping of India-WRIS and development of decision support systems will make a beginning in tackling some of these issues. However, this will need whole heartedly and continuous support from all the implementing Agencies (IAs). For modernisation and up-gradation of water resources data network and taking up various studies under NHP, State IAs is equal partner.

Though the progress of various activities of NHP till date was not very encouraging, I can understand the problems being faced by State IAs on account of hydro-met data network, World Bank procurement process etc. However I am hopeful that henceforth IAs would be able to achieve better progress and achieve the target.

Recently we have organised 1st International Conference under NHP at Chandigarh. As these conferences are vital for knowledge sharing among stake-holders, participants & general public awareness, next International Conference under NHP would be organised tentatively in October-November, 2019. I solicit cooperation of all IAs in organising this conference.

Many important activities are ongoing in Ministry of Water Resources, RD & GR and I am hopeful jointly we will be able to achieve reasonable success under NHP to solve some of problems being faced by India in water sector.

Sh. U.P. Singh
Secretary
MoWR, RD & GR

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Dear Colleagues,

The deluge of Kerala has triggered an intense debate at various forums particularly pointing to a possible aggravation of the flood due to the release from reservoirs, and debate is likely to continue for some time. However, as a National Hydrology Project family, we cannot keep debating. This is high time for evidence based decisions. What-so-ever the exact reasons for this unprecedented flood were, the deluge, without any ambiguity has pointed towards the need for high quality hydro-meteorological data for being analysed and used in decision support systems. There is no doubt that an efficient flood forecasting system would have led to reduced flood damages to some extent.

At this juncture I would like to stress upon the need for expediting the process of establishing hydro-meteorological monitoring networks under NHP. The setting-up, calibration and validation of hydrological models largely depend on this. Considering the peculiar topography of our country and its umpteen hydrological response units, a dense rainfall network particularly in hilly regions would provide better information about the variability of rainfall. Meteorological networks coupled with river and reservoir gauging would help in the integrated operation of reservoirs. Taking a cue from the Kerala flood, the development of Decision Support Systems (DSS) for river basins and the establishment and operation of flood forecasting systems are to be taken up by Implementing Agencies at the earliest, especially in areas vulnerable to floods. For the development of DSS and the establishment and operation of flood forecasting systems, a comprehensive real time water resources information system is a pre-requisite. I am confident that with the support of all Implementing Agencies, the National Water Informatics Centre (NWIC) established under NHP will fulfil these goals.

I am quite hopeful that the initiatives developed under NHP will contribute to avert such huge losses due to water induced natural calamities in the future.

Sh. Akhil Kumar
Joint Secretary
MoWR, RD & GR
To provide a platform for water resources professionals, scientists, academia and decision makers to discuss evolving water management challenges and opportunities in India, series of annual International Water Management Conferences are envisaged under National Hydrology Project (NHP).

The first such International Conference on the theme 'Sustainable Water Management' during 10-11th Dec., 2018 at Chandigarh was organized by Bhakra Beas Management Board (BBMB). The Conference was organised at the serene campus of Indian School of Business, an internationally acclaimed business education institution with World Class Infrastructure. About 500 participants comprising of national and international water resources professionals, experts from academia and research institutions, industry and students/research scholars including foreign experts from 10 countries (Australia, United Kingdom, USA, Spain, Netherlands, Republic of Korea, Canada, Germany, Sri Lanka, Vietnam) participated in the event.

The Hon’ble Governor of Himachal Pradesh, Shri Acharya Dev Vrat was the Chief Guest of the conference. The other dignitaries for the inaugural session included Shri U.P. Singh, Secretary, MoWR, RD & GR; Shri S.M. Husain, Chairman, Central Water Commission; Shri D.K. Sharma, Chairman, BBMB; Shri Akhil Kumar, Joint Secretary (IC & GW); Shri Sarvijit Singh, Pr. Secretary, Water Resources, Punjab; Shri Anurag Rastogi, Principal Secretary, Dept. of Irrigation & WR, Haryana; Mr. Felix B. Reinders, President, International Commission on Irrigation and Drainage (ICID); Prof. Nick Schofield, CEO, Australian Water Partnership (AWP), Australia; Mr. Eduardo Sánchez, Deputy Chief of Mission Embassy of Spain in India. The Plenary Session was addressed by Shri S. Masood Husain, Chairman, CWC, Shri D.K. Sharma, Chairman, BBMB and Dr. Kees Bons, Expert on Integrated Water Resources Management, Deltares, The Netherlands.

Fifteen technical subjects, in three parallel sessions, were held on topics like River Basin Planning, Conjunctive Use of Surface and Ground Water, Climate Change and Adaption Measures, Integrated Water Resources Management, Irrigation Management, Water Governance and Conflict Management, Hydro-informatics, Innovative Irrigation Practices, Technology Innovation in Water Management, Flood Modelling and Management, Water and Energy Security, Water and Environment, Flood and Drought Management, Water Management Initiatives under NHP and Water Quality and Sediment Management. An industry session was also organised in which representatives from ESRI, Vassar Labs, SEBA, GeoKno, Encardio, Mechatronics, Xylem, Jain Irrigation etc. were participated. New products and technologies that hold the potential to collect input data for modelling in better ways, carry out modelling in spatial domain with greater ease, apply data and modelling to create useful water resource information and reduce usage of water in sectors like irrigation were demonstrated. A poster competition was also organised for the research scholars and M. Tech students in which prestigious institutions like IIT Guwahati, Jadavpur University, IIT Bombay, IIT Kharagpur, Amity University participated. Research scholar from Jadavpur University won the first prize.
The conference provided an excellent platform to exchange ideas and good practices, create and strengthen partnerships, learn about new developments and discuss about different aspects of sustainable water management. The 2nd International Conference under NHP is likely to be organised in October-November, 2019.

**Recommendations from the Conference**

1. Need of the hour is to accord due priority to proper management of water resources.

2. Water resources optimisation will not be able to achieve its desired goals if it is not coupled with economic and social interests.

3. India should have an overarching water strategy prepared with a long term perspective with scope for periodic review.

4. Ecological aspects of river system should be accorded due importance by developing and managing water resources.

5. Agencies related to water are required to assign due importance to data acquisition, validation, transformation of the same into the knowledge product and development of simplified decision support systems based on Open Source Software.

6. States to have liberty to develop and manage water resources within their allocation, however the perspective of integrated water resource management at basin scale is to be kept in mind by various basin states to have win-win situation.

7. Natural farming without use of synthetic fertilizers and pesticides should be encouraged to ensure sustainable ecology.

8. Innovative state of art technologies should be used for water resources assessment, monitoring and management.

9. Cropping pattern to be adopted keeping in mind the climatic conditions, soil type and availability of water.

10. Efficient irrigation systems to be adopted to minimise agricultural demand and create scope for allocation to other sectors and inter-state water trading

11. Development of groundwater management practice involving local stakeholders is the practical way to ensure smooth implementation

12. Centralised integrated database and efficient database management system should be developed for seamless sharing of data between central and state organisations.

13. Climate change impacts are already conspicuous and needs to be incorporated into the planning process to improve resilience

The number of states has limited capacity to understand hydro-meteorological aspect which is intrinsically associated with development and management of water resources. NHP is an appropriate platform for capacity building for such states and organizations.
KERALA FLOOD: WE STAND TOGETHER

The unprecedented flood situation in August 2018 affected 13 out of 14 districts in Kerala. The deluge caused the death of more than 300 people and 13 lakh people had to be evacuated from their homes and sheltered in relief camps. Continuous spell of high intensity rainfall was the prime factor that triggered the deluge. The situation further aggravated due to the inadequate carrying capacity of channels coupled with releases from the dams most of which were near FRL (Full Reservoir Level) prior to the event. The magnitude of high-intensity rainfall can be gauged from the fact that for the first time in the state’s history, 35 spillway gates of its 54 dams had to be opened. At this time, most of the rivers in the state were already flowing in full, especially the Periyar and Pampa River along with its tributaries – Achankovil and Mamallyar River. Although due to peculiar topography of the state and river basins disposition, it was very difficult to significantly mitigate the ill effects of the deluge, yet appropriate hydro-meteorological network coupled with hydrological/hydraulic modelling system and existence of operating rules of reservoirs from flood angle would definitely have, reduced the impact of the floods.

The NHP - with one of its main objective of improving capacity of water resource management institutions in India, offered the required support to Kerala through Kerala Water Resources Department (KWDRD) – implementing agency of NHP for future improvements in flood management and reservoir operations within the state.

POST FLOOD SUPPORT TO KERALA: finding a holistic solution

A team comprising of officers from NPMU, CWC and TAMC visited Kerala in September 2018 to take stock of the situation and met the officials from Kerala Water Resources Department, Kerala State Electricity Board to discuss the further course of action that will allow aperion of such losses in case of natural calamities of extreme order. The first meeting was organized at the office of the KWRD on 25th September under the Chairmanship of the Secretary, Kerala Water Resources Department. This was followed by the field visits to the worst affected districts and towns including few places in Vypin Island, flood-affected areas of Alleppy, Thottapally Barrage, Thannermukkom Barrage, Arangaly Gauge Site and Athirapally Gauge Site on Chalakudy River.

The wrap-up meeting was attended by the representatives from NPMU, CWC, Dam Safety Organisations, Kerala Water Resources Department, Kerala State Electricity Board, National Institute of Technology Calicut, and Dam Rehabilitation and Improvement Project Team. The expeditious operationalization of real time densified and upgraded hydro meteorological instrumentation network was stressed upon, as the calibration and validation of a flood forecasting model would largely depend on timely data from this network. NHP, CWC and DRIP team expressed their commitment to work in tandem to extend technical and financial help needed for development of flood forecasting system and integrated operation of reservoirs. The future course comprised of following actions: Development of reservoir operation system integrated with flood forecasting system would be taken up on priority for the Periyar and Pampa River Basins and the Chalakudy River catchment inside the Periyar Basin.

The inflows and release from the upstream reservoirs would be captured using a Real-Time Data Acquisition System, including dams in the upstream catchment that are under the control of the state of Tamil Nadu.
FINANCIAL PROGRESS

Since its inception in FY 2016-17 to the date 31st December 2018, a total expenditure of Rs.123 Crores has incurred under National Hydrology Project. The expenditure for the FY 2018-19 up to Quarter ended December 2018 was Rs.59 Crores.

Fund released to the IAs during FY 2018-19, up to the Quarter ended December is Rs.45 Crores. Cumulative released till the month of December is Rs.275 Crores.

Out of the 48 IAs, PFMS has been implemented by 46 IAs.

To provide handholding support, the finance team of TAMC visited 21 IAs up to the Quarter ended December 2018.
WHY SURFACE WATER AND GROUND WATER INTERACTION IS CRUCIAL

Each ecosystem and its components depend on each other and so surface water and groundwater interaction is an essential component of the hydrological cycle. This hydraulic connectivity and exchange of water between surface water (e.g. rivers, lakes, wetlands) and underlying aquifers provide all ecosystem services that sustain human and ecological well-being.

Streams are the instance from the hydrological cycle; they gain water from the inflow of groundwater where the stream water surface is lower than the water table and streams lose water where stream water surface is higher than the water table. Same case is with surface water bodies like natural lakes and artificial dams. It is primarily the groundwater contribution that keeps streams flowing during the lean season. The movement of water between groundwater and surface-water systems leads to the mixing of their water qualities. High quantities of nutrients or other dissolved chemicals in surface water can be transferred to the connected groundwater system.

Imbalance of anyone resulting in decline in groundwater levels, drying of streams, shrinking lakes, wetlands, and estuaries has been observed across the world. Such environmental changes on groundwater and surface water interactions affect the quality and quantity of water resources.

It is crucial that resource managers, researchers, consultant groups, and government agencies have a basic understanding of the types, mechanism, and effects of natural and anthropogenic land use changes on groundwater and surface water interactions. If this interaction is not considered in the policy and planning level, it may lead to a water crisis. It is necessary to practice Integrated Water Resource Management through various water management tools to sustain the available water resources for the human being.
DEVELOPMENT OF A NEW INTEGRATED WATER INFORMATION SYSTEM

The improvement and further development of the existing water resources database and information systems, e-SWIS and India WRIS is currently in progress. Under NHP, a new integrated information system with additional functionalities and features is being developed. One of the main features will be a module for receiving data from the new telemetry hydromet stations proposed to be installed under NHP. A new groundwater module is also being developed, making groundwater data more easily available and allowing for integrated analyses of water resources. The new development will significantly contribute to improving system performance. Many activities are currently ongoing and further improvements will become visible over the coming months. India-WRIS draws its strengths from numerous GIS layers that provide map display for most of the datasets that are stored in it. The new system aims to combine the existing eSWIS and India WRIS to work together such that to the end user, the final product has a “look and feel” of a single platform while combining and improving the strengths and best features of both the systems. It is being planned to include technical documentation, user help and training documents, system installation manual, etc. into the revamped web interface.

**During the quarter ending December, 2018, IT team of TAMC has achieved progress on:**

1. The new eSWIS stations and series management module have been completed.
2. Several modules of the new integrated system have been deployed on a private cloud and are currently being tested.
3. Telemetry data are being received by the new telemetry module and the new functionalities are being tested.
4. On the basis of an agreement with CGWC the team has started to define the requirements of the new eSWIS groundwater module.
Technical Studies

National Hydrology Project (NHP) has intensified the interactions with the Implementation Agencies (IA) for initiating some of the technical studies proposed within the Annual Work Plan (AWP) of 2018-2019. The technical team had detailed discussions with agencies regarding the data requirements for the various studies to be undertaken by them. It was suggested that the following types of studies may be initiated by the agencies during this year:

- Reservoir sedimentation surveys
- Dam-break analysis
- Flood inundation modelling and forecasting
- Early hydrological forecasting (forecasting of water availability three months ahead of time)
- Multi-reservoir utilisation optimisation studies for large basins (Narmada) and small catchments (Mahanadi reservoir complex in Chhattisgarh)

Leading national agencies like Central Water and Power Research Station, who possess expertise in bathymetric survey were approached for undertaking reservoir sedimentation studies. Survey of three reservoirs including two in the North East are scheduled to be taken up this year.

National Institute of Hydrology (NIH), with their wide expertise in modelling the various components of the water cycle, are helping the implementing agencies to carry out studies, as well as build the capacity of the departmental staff. The Technical team has also been providing guidance to the implementing agencies to finalise their instrumentation network, with particular reference to the intended objective of flood forecasting. Vendors were invited to the NHP office to demonstrate their experience and latest technologies for reservoir survey on 28th August 2018. Preparation of comprehensive terms of reference to carry out dam break analysis after estimation of revised design flood post design storm analysis, that includes obtaining river cross sections from the field to improve model performance is underway and will be shared to the agencies shortly.

Fourth committee meeting for review and approval of Purpose Driven Studies (PDS) was held on 16th -17th Jan 2019 at National Institute of Hydrology, Roorkee and two studies were approved. Altogether, 35 PDS studies have been approved till date. The committee also reviewed the annual progress for nine PDS that were approved earlier.

Within NHP, some barrages/reservoirs, canals, and groundwater operation systems will be equipped with the Supervisory Control and Data Acquisition (SCADA) based remote-control, in addition to real-time data acquisition systems. This will allow for remote control of gates and operation from a control room, as well as allow for system response on a real-time basis during floods or other emergencies.
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MANAGEMENT INFORMATION SYSTEM

National Hydrology Project (NHP), IT team with the inputs from all the stakeholders have developed a management information system (MIS) to produce information that supports the management functions of the organisation and facilitates the decision-making process. All agencies are now a part of the organised approach of collecting, processing, storing and disseminating data to carry out management functions. Continuous efforts are made to enhance the functionality of the system for better user experience. During last six months many new features have been introduced in the system.

A new Procurement Module has been developed to provide the feature to create and monitor the procurement packages at the Item Level. Successful efforts have been made to synchronize procurement module with the STEP system of the World Bank. Tools have been shared with the implementing agencies to transfer the procurement plan from MIS to STEP and procurement milestones progress data from the STEP to MIS for monitoring the packages.

System is enabled to identify the discrepancy if any between the STEP and MIS procurement packages. Tender management process till award of contract can now publish automatically in the NHP website. As part of the tendering process; workflow based online bid document review system have also been implemented for monitoring and tracking status of bids by NPMU.

The old training module has been revamped with new features. User profiling with introduction of OTP based authentication has been implemented. Automated training related notification on acceptance of participation has been introduced. On completion of the training online feedback on the same is in place now.

Website development and implementation support is provided to recently held International Conference on Sustainable Water Management at Chandigarh, organised by BBMB.

Admin & Agency Dashboard have been implemented to provide the snapshot of the overall progress of the project at Agency and NPMU level and based on the physical and financial performance.

A Hydromet module with facility to add and update new or existing stations is added in the system, with facility to display the locations in the map. This module will further be integrated with new WRIS system.

Workflow based Purpose Driven Study (PDS) module is also been implemented where all approval is made online along with the tracking of the progress of the activities. This has features to obtain expert review inputs directly.

Monitoring & Evaluation (M&E) module has started functioning for regular updation of both the progress and output indicators in order to comprehend the relation between outputs and objectives. In other words, the MIS started communicating the involved relationship between budgets, activities, and outputs; and enabled monitoring of the process of programme implementation.

To support upcoming WB Mission for evaluation of participating agencies under NHP, an agency ranking module is developed and implemented.

Additionally, all necessary handholding and operational support have been intensified to all the agencies through phone, email, WhatsApp etc. for better implementation of the system.
Procurement is an important component under NHP to drive financial progress. Under NHP, procurement of items includes constructing Piezometers, Real-Time Data Acquisition Systems such as AWS, ARG, AWLR, DWLR, SCADA, ADCP, Water quality equipment and IT equipment (Hardware & Software).

<table>
<thead>
<tr>
<th>Total Nos. of Tender Awarded</th>
<th>The Total cost of Tender Awarded</th>
<th>Total Nos. of Tender Floated</th>
<th>The Total cost of Float Tender</th>
</tr>
</thead>
<tbody>
<tr>
<td>186</td>
<td>Rs. 222Crore.</td>
<td>99 Documents</td>
<td>Rs. 373Crore</td>
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### Major Contracts Awarded

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Procurement Description</th>
<th>Implementing Agency</th>
<th>Estimated Value</th>
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<tbody>
<tr>
<td>1.</td>
<td>ARC GIS</td>
<td>Andhra SW</td>
<td>Rs.36Lakh</td>
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<td>2.</td>
<td>ARC GIS</td>
<td>DVC</td>
<td>Rs.20Lakh</td>
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<td>3.</td>
<td>ADCP, Current Meter and resistivity meter</td>
<td>WEST BENGAL GW</td>
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<td>4.</td>
<td>RTDAS</td>
<td>DVC</td>
<td>Rs.7.25Cr</td>
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<td>5.</td>
<td>RTDAS</td>
<td>Andhra Pradesh</td>
<td>Rs.10Cr</td>
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### Major Tender Floated

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<th>Sl. No</th>
<th>Procurement Description</th>
<th>Implementing Agency</th>
<th>Estimated Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.5m Digital Elevation Model (DEM) data acquisition and processing</td>
<td>SOI</td>
<td>Rs.83.25 Cr.</td>
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<td>2.</td>
<td>Creation/ updation of 1:25k Geo data base</td>
<td>SOI</td>
<td>Rs.44 Cr.</td>
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<td>3.</td>
<td>RTDAS</td>
<td>Assam</td>
<td>Rs.11.81 Cr.</td>
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<td>4.</td>
<td>RTDAS for Madhya Pradesh –Phase 1 (Ganga Basin)</td>
<td>Madhya Pradesh</td>
<td>Rs.8.67 Cr.</td>
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<td>5.</td>
<td>RTDAS for Bundelkhand Region</td>
<td>Uttar Pradesh SW</td>
<td>Rs.7.15 Cr.</td>
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<td>6.</td>
<td>Construction of State Data centre Building</td>
<td>Sikkim</td>
<td>Rs.4 Cr.</td>
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<td>7.</td>
<td>RTDAS</td>
<td>Jharkhand</td>
<td>Rs.3.96 Cr.</td>
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<td>8.</td>
<td>SCADA System for Okhla Barrage &amp; Its Regulators</td>
<td>Uttar Pradesh SW</td>
<td>Rs.3.75 Cr.</td>
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<td>9.</td>
<td>SCADA</td>
<td>Rajasthan</td>
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<td>10.</td>
<td>RTDAS-Godavari Basin in Marathwada Region</td>
<td>Maharashtra SW</td>
<td>Rs.16 Cr</td>
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<td>11.</td>
<td>RTDAS - Godavari Basin in Vidarbh Region</td>
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<td>12.</td>
<td>RTDAS -Tapi Basin.</td>
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<td>13.</td>
<td>RTDAS for Uttarakhand</td>
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<td>14.</td>
<td>RTDAS ( AWLR, ARG &amp; AWS)</td>
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<td>15.</td>
<td>RTDAS-Rajasthan</td>
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<td>Rs.15 Cr.</td>
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National Level Steering Committee (NLSC) of NHP held its 2nd meeting on 20th December 2018. The agenda of the meeting included the review of NHP activities & implementation status, follow up action on the decisions taken during the 1st meeting of NLSC, Physical & Financial progress of NHP, Merging of Hydrological Information System Management Groups (HISMG), National Water Informatics Centre (NWIC)- Issues & Way forward, Hydro-met data sharing policies and status, specific issues raised by implementing Agencies and Inclusion of Experts from the Central Ministries & Research Institutions.

Data Dissemination Policy, Finalization of surface and ground water network, Finalization of specifications of the Hydro-met equipments are some of the major achievements made during this period. NHP has come up with its own procurement manual, standardized bid documents, guidelines for RTDAS system etc for seamlessly managing its implementation at all level. Lot of efforts have been made towards having an Integrated Water Resources Information System in place. Finalization of architecture for revamped India-WRIS and e-SWIS, telemetry module to automatically capture telemetry data in e-SWIS and groundwater module for e-SWIS have been done.

The meeting was attended by representatives/ Nodal Officers from NPMU, World Bank, CGWB, CPCB, SOI, CWPRS, NIH, IMD, NRSC, and some of Implementing Agencies (Bihar SW & GW, Haryana, Himachal Pradesh, Jharkhand, Kerala, Mizoram, Telangana, Uttar Pradesh).
PDS (PURPOSE DRIVEN STUDIES)

The Purpose Driven Study (PDS) is a component (C) of the project to develop cost-effective measures to address water management and environmental issues in an area & to upscale on a larger scale. A study on “Impact of Urbanization on Groundwater Quality & Quantity and its Management in Greater Hyderabad Municipal Corporation (GHMC) Area, Hyderabad” has been undertaken with consultancy support on technical aspects with National Geophysical Research Institute (NGRI), Hyderabad. As a part of the activity, a contract agreement has been signed by Director, Ground Water Department, Telangana (Client) with Director, National Geophysical Research Institute (CSIR-NGRI) (Consultant), Hyderabad on Dated 18.01.2019

OBJECTIVE OF PDS

With the objective of building up institutional capacity for evidence-based decision making in water resources planning and operational management, Purpose Driven Studies have been proposed under NHP. It focuses on the use of latest technology and tools to be delivered by the implementing agencies in partnership with academic institutions/ research organisations across India. From the date of its commencement, a total of 55 PDS have been presented out of which 33 of them have been approved and are currently ongoing.

Among some notable ones, one of the PDS is on development of a comprehensive plan for conservation and sustainable management of Bhimtal and Naukuchiatal lakes in Kumaon region of Uttarakhand. The study aims to understand the hydrological regime of the lake by investigating the various hydrological processes. The major objectives of the proposed study are to assess i) seasonal water availability of the lakes and its adequacy in meeting future demands ii) the water quality of the lakes and possible causes of its degradation iii) sedimentation rate and expected life of the lake. The proposed outcome of the study is to provide a comprehensive plan for conservation and sustainable management of the lakes.

One of the studies focuses on the understanding of arsenic release mechanism and delineation of arsenic safe zone / aquifer for drinking water supply in Bhojpur, Bihar. It aims to draw inferences about the processes controlling the composition of groundwater from field measurements through monitoring of contaminated aquifer and geochemical modeling.

➢ To identify and characterize the potential contamination sources which pose a hazard to groundwater
➢ To identify and characterize the potential receptors, and delineate the occurrence of groundwater contaminants
➢ To develop a conceptual model of groundwater flow and pollutant migration in the urban aquifer of the GHMC area.
➢ To formulate a strategy for the protection of groundwater resources, and the management and restoration of contaminated groundwater, identify the scope of follow-up investigations or risk assessments as appropriate.
➢ To upscale the results of PDS in a similar environment on a larger scale.
WATER ACCOUNTING + TRAINING

‘Water Accounting Plus’, developed by IHE, Delft the Netherlands in association with IWMI is a remote sensing based framework for assessment and reporting of water resources status, for calculation of water use efficiency, availability allocation and consumption. WA+ is a comprehensive depletion accounting framework for assessment, reporting, communicating and analysis of water resources status based on open access datasets, and with standard terminology.

To understand and apply this modern technique in India and taking advantage of launch of National Hydrology Project (NHP), MoWR, RD & GR decided for capacity building of it's official's on WA+ spread over three modules. As part of 1st module, a team of 12 water professionals from various organizations of MoWR, RD & GR and NRSC (6 from Central Water Commission, 2 each from CGWB, NIH and NRSC) were selected for training on this tool at IHE-Delft, The Netherlands (3 months) and NWA, Pune (2 months with faculty from IHE). As a part of this programme, WA+ framework was used for assessment of water resources of Cauvery basin as a test case.

After completion of the training programme, a knowledge dissemination workshop was organized at NWA, Pune on 4th September 2018. The workshop was aimed at introducing water accounting plus (WA+) framework as a tool for integrated and independent assessment of water resources of a basin. Senior water professionals from the co-basin states of Cauvery basin (Karnataka, Kerala, Puducherry and Tamilnadu) attended the workshop along with officials from MoWR, RD & GR, CWC, NRSC, and IHE-Delft. Principles and methods of WA+ framework, various global datasets used for water assessment and Cauvery basin case study were discussed during the workshop. In this workshop, State Government officials have shown keen interest in knowing about datasets used by the trainees and the process of arrival of basin wise supply and utilization maps. The workshop ended with an open discussion on how WA+ framework can add value to prevailing practices of water management. The participants appreciated the potential of the new tool and expressed their willingness to learn more. It was agreed by all participants that WA+ framework is futuristic and would be a useful tool for water managers. They also expressed eagerness to be part of water accounting exercises involving WA+ framework.
VISIT OF STATE OFFICIALS TO AUSTRALIA

A technical visit was organised by NHP in the perspective of Integrated Water Resources Management and learning experiences of the Murray Darling Basin on 3rd to 7th September 2018. Statelevel Officials from water resources department from Government of Maharashtra, Karnataka, Andhra Pradesh & Telangana took part in this exposure visit. The purpose of visit was to expose representatives from Krishna, Godavari and Mahanadi Basin State Governments to water reform in the Murray-Darling Basin, including the relationship between the federal and state governments, industry and user groups. The mission complements the longer-term capacity development objective under the NHP.

MODELLERS MEET

With a view to promote and enhance the usage of mathematical models in water resource among various stakeholders, a “Modellers Meet” was organized in New Delhi by the World Bank and NPMU in association with National Institute of Hydrology (NIH) on 26th - 27th September at Le Meridian & Imperial Hotel, Delhi.

The objective of the meet was to provide a platform to the IAs to present the modelling activities carried out so far, their current requirements and to provide the opportunity to start technical discussions and knowledge sharing amongst the Water resource modellers in the country. The various models covered during the event were: Basin planning and water accounting, Flood forecasting and reservoir operation, Groundwater modelling etc. Modellers from CWC, NIH, NRSC, Gujrat, Rajasthan, Tamilnadu, Karnataka, Kerala, Telangana, AP and CGWB presented their models which were further discussed upon. Leading consultancy firms DHI, RMSI, RTI and TAHAL also presented their modelling works along with TAMC, e- Water, AECOM and SECON. The conference concluded with a note to widen capacity around mathematical modelling.
WORKSHOP WITH AUSTRALIAN WATER PARTNERSHIP

Within the framework of cooperation between the Ministry of Water Resources and the Australian Water Partnership a workshop was held on 18 and 19 December 2018 at the Imperial Hotel in Delhi during which experts of the Australian Bureau of Meteorology (BOM) presented the Australian Water Resources Information System. The Australian experts gave an overview of the different modules of the Australian system and provided insight into the circumstances under which it has been developed, the objectives pursued and the particular challenges encountered during the development.

The meeting was attended by participants of several NHP implementing agencies, representatives of the Ministry of Water Resources and World Bank officers. Several experts of various agencies presented the results of their works related to the development of water resources information systems. Institutional and organisational, as well as technical aspects were discussed.

The workshop provided an excellent opportunity to gain insight into the Australian Water Resources Information System, exchange knowledge and discuss relevant aspects for the development of Water Resources Information Systems in India.

Other TRAININGS

- **Hydrological Modelling Using HEC-RAS and HEC-HMS** – The training was organized by NIH during August 27-31, 2018 at Roorkee and was attended by 22 participants from State and Central organizations.

- **Water Quality Management Plan** - On 27th & 29th August 2018, a training programme on Water Quality Management Plans was organized by CPCB at IIPA, New Delhi.

- **Training on “Basics of Hydrology”** - The National Institute of Hydrology (NIH) and WALMI Bhopal jointly organized a training on “Basics of Hydrology” during July 23-27, 2018 at WALMI, Bhopal as part of the NHP training activities.

- **World Bank Procurement Procedures and PFMS at NWA Pune** - 44 participants attended a training program on World Bank Procurement Procedures and PFMS organised at by NPMU and TAMC at the National Water Academy, Pune from the 23rd to 27th July 2018 with the active support of the World Bank.

- **Two Week Training on Application of GIS & Remote Sensing in Water Resources** - The National Remote Sensing Centre (NRSC), Hyderabad has organized a programme from 30th July to 10th August on the application of GIS & RS techniques in Water Resources planning and management.

- **Training on Integrated Water Resources Management (IWRM)** - Training on IWRM was organized by the National Water Academy Pune from 30th July to 3rd August’18. 15 participants from various Implementing Agencies took part in this training.

- **Training on “Quality Assurance and Quality Control in Laboratory Analysis”** - A three day (22nd-24th Oct, 18) training programme was organized by CPCB on “Quality Assurance and Quality Control in Laboratory Analysis” at the Indian Institute of Public Administration.
ONE-WEEK CUSTOMIZED COURSE ON “REMOTE SENSING & GIS TECHNOLOGIES”

A one-week customized training programme was conducted at National Remote Sensing Centre (NRSC)/ISRO, Hyderabad for water resources engineers of Central / State government departments under NHP during 29th October to 2nd November 2018. A total of 13 officials participated. The course is designed in such a way that it covers the overall concepts of Remote Sensing & GIS starting from the fundamentals to hands-on exercises.

THE GLIMPSES FROM THE TRAINING EVENTS

“Hydrological Modelling Using HEC-RAS and HEC-HMS” was jointly organized by NIH and WRD Kerala, 18th to 22nd December, 2018 at Thrissur.

“Training programme on “Real Time Kinematic (RTK) River Research Institute, West Bengal 5th to 7th December, 2018, at River Research Institute”

Training on “Remote Sensing & GIS Technologies”
29th October 2018 to 2nd November 2018, NRSC ISRO Hyderabad.

“Water Information & Analytics Generation using Free Online Tools” from 26th to 30th November 2019 at National Water Academy, Pune.


5 Days training programme on “e- Swis & Discharge Measurement under National Hydrology Project, 17th to 21st December at Administrative Training Institute, (ATI) of Government of West Bengal.”
PROGRESS AT THE FIELD

Bhumi Pujan/Stone Laying Ceremony of SCADA Building at Durgapur West Bengal under NHP

Construction of State Water Information Centre at Roorkee under NHP in full swing

Construction of Hydrological Data Center of DVC under NHP - Concreting of footing of Hydrology Control Room at DVC Maiton, Dhanbad, Jharkhand on 12th October, 2018

Andhra Pradesh GW NHP team conducting awareness programme on groundwater among engineering students in drought prone district of Andhra Pradesh on 6th October, 2018

Shri LetaoHaokip, Honb’ Minister of Water Resources, Govt. of Manipur laying the Foundation Stone of State Hydrological Data Centre at Manipur

Secretary AP Water Resources Department releasing book on GEC in state level steering committee meeting on 16th November, 2018 along with Regional Director, CGWB, Special Commissioner, CADA, Director Groundwater and Water audit Department and other officials

On 2nd November, 2018 AP GW has entered into MoU with IIT Thirupathi to promote research on water resources jointly on and open the door for staffs to pursue MS and Ph.D in these areas.
NPMU & TAMC- VISITS & MEETINGS

- A presentation on WA+ Programme held on 2nd July 2018 at MoWR, RD & GR in which Secretary, WR, RD & GR was also present.

- A meeting between Australian Water Partnership, CWC, CGWB & TAMC was held during 13th - 17th August 2018 on collaboration in establishment & functioning of NWIC.

- NPMU and TAMC members visited Jharkhand on 6th September 2018. The visit was meant to provide organizational development support to Jharkhand.

- NPMU and TAMC team held meetings with concern IAs at Vijaywada and Hyderabad on 17th September 2018 on extending implementation support to them.

- TAMC team visited Samrat Ashok Sagar Project, Madhya Pradesh for Canal Automation on 11th September, 2018

- Visit to a deep monitoring well and a DWLR site in Lucknow Urban Area operated by the Ground Water Department of Uttar Pradesh on 13th September, 2018.

- NPMU and TAMC team met the Irrigation and Water Resources Department, Uttar Pradesh on 12th September, 2018.

- The first Meeting of the project management board of NHP held on 27th November at NRSC, Hyderabad.
जल है तो
अमृत और दूसरा क्या है
यह जल ही तो अमृत है।
जल है तो
समस्त कल है
आशान्नित अपना
हर पल है।

जल का जो
समझे न मौल
उसे बटाओं
यह कितना अनमोल।

जल श्रोतों से
प्राप्त जल से
प्राणों का संसार
जल ही से तो
सभी हमारे
यह समग्र संग्राम।

अपवाद खुद
जल का रोको
कोई और करे तो
उसे भी टोको
नल खुले छोड़ना
घोर पाप है
यह सब जैसे
एक अपराध है।

जल से ही
जीवन का वजुद है
अपवाद होता
बाबूजुद है।

सब मिलकर
बघाओ बूंद-बूंद जल
बर्ना नजर आएगे
कूटों के तल
खेतों में नाही
चल पाएगे हल।

EARTH'S ROTATION

Years run in ease
Seasons change face
Monsoon showers
Batters and fulfil hopes.

A deluge unprecedented
Water on steep slopes
Submerge land
Leaves destruction on trail.

A blade of grass wither
Watching for a rain drop, wilts
Clouds arrive albeit water
Belles wait many a time.
Winds move on
Return touching mountains
Happy and sad betray
Inland receiving rain.

Suspience ends
Events on hind sight
Mountains echo, with
Green leaves on shrubs sprout.

Poetry by Dr. K Venugopal
Director, Arthara Pradish

Sources by: indiwaterportal.org
Upcoming Events


Get in touch with NHP

You can now directly connect with us. Please visit NHPConnect on Facebook for updates, to share your views, comments, feedbacks etc. We value your opinions.

Share photos and videos with us even from a smartphone. We are interested in stories on Water. Visit our Instagram account nhpconnect.

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You can also send us mails at NHPConnect@gmail.com. We will be happy to listen from you.