

**APPROVED MINUTES OF 70<sup>th</sup> MEETING OF  
TECHNICAL ADVISORY COMMITTEE OF  
NATIONAL INSTITUTE OF HYDROLOGY  
HELD ON 1 SEP 2017 AT NEW DELHI**

The 70<sup>th</sup> meeting of the Technical Advisory Committee (TAC) of the National Institute of Hydrology, Roorkee was held in the Central Water Commission, New Delhi on 1 Sep 2017. The meeting was chaired by Er Narendra Kumar, Chairman, CWC. The list of the participants is given in Appendix -I.

The Chairman in his opening remarks welcomed the members and the invitees. He appreciated the works being carried out by NIH, and urged that the Institute should accord priority to conducting applied research, with a focus on the latest development taking place in the water sector. After a round of introduction, the TAC members were requested to offer their general comments and suggestions on the working of NIH.

Er. N K Mathur, Member (D&R),CWC	<ul style="list-style-type: none"> <li>• NIH may focus on applied hydrologic research which leads to solution of problems being faced by practitioners</li> <li>• Work related to surface water hydrology dealing with development of Unit Hydrograph, rainfall runoff modeling, design flood estimation, impact of climate change on hydrologic extremes, etc. Need to focus on a particular basin or sub-basin, which could provide a better alternative to current practices</li> </ul>
Dr. Ravinder Kaur, Director, WTC, Delhi	<ul style="list-style-type: none"> <li>• Offered to partner with NIH to develop cross-collaborative programmes</li> </ul>
Sh K B Biswas, Chairman, CGWB	<ul style="list-style-type: none"> <li>• Appreciated the RBF study and the study on MAR for groundwater augmentation in NCT Delhi</li> </ul>
Prof. N K Goel, IIT Roorkee	<ul style="list-style-type: none"> <li>• There is need for enhanced interactions between NIH scientists and TAC members</li> </ul>
Prof. K P Sudheer, IIT Madras	<ul style="list-style-type: none"> <li>• NIH may take up Awareness on Water Issues in pro-active mode</li> <li>• NIH may initiate studies on urban flooding</li> </ul>
Prof. KV Jayakumar, NIT, Warangal	<ul style="list-style-type: none"> <li>• Enhance interactions with academic institutions</li> <li>• Enhance visibility of NIH's work and output</li> <li>• Quality of publications needs to improve - avoid publishing papers in paid journals</li> <li>• TAC meetings may be held at NIH, Roorkee</li> </ul>
Sh Sanjay Kundu, JS(PP)	<ul style="list-style-type: none"> <li>• NIH may develop content of the modules on 'Awareness on Water Issues' to be prepared for inclusion in the text books. MoWR will write to MHRD for curriculum revision</li> <li>• Consider holding TAC meetings on Saturdays</li> </ul>

Dr V C Goyal, Member-Secretary, also welcomed the Chairman, members and invitees. He then took up the agenda items.

#### **ITEM NO. 70.2: Confirmation of the Minutes of 69<sup>th</sup> Meeting of TAC**

The Member-Secretary informed that minutes of the 69<sup>th</sup> meeting of TAC, held on July 21, 2016, were circulated to all the members and invitees vide letter No. NIH/RCMU/TAC/34/11 dated September 6, 2016. Since no comments were received from the members, the Minutes were confirmed by the TAC.

#### **ITEM NO. 70.3: Action Taken on the Decisions/Recommendations in the Previous Meeting**

The Member-Secretary informed that the suggestions offered during the previous meeting have been noted for compliance.

#### **ITEM NO. 70.4: Status of the Work Programme for the Year 2016-2017**

The Member-Secretary briefed about the studies carried out by the Institute during the year 2016-2017. Members appreciated the number of publications brought out by the Institute and number of training/workshop/symposium organized by the Institute.

The following studies completed during 2016-2017 were presented during the meeting:

1. Ionic Enrichment Dynamics of Glacial Sediment and Melt Water of Gangotri Glacier (EH Division)
2. Feasibility and Scope of MAR for Groundwater Augmentation in NCT, Delhi (GWH Division)
3. Hydrological modelling of Brahmani Baitarani river basin using eWater Source platform (SWH Division)

TAC noted the status of work programme for the year 2016-17.

#### **ITEM NO. 70.5: Report the Proceedings of the Working Group and RCC Meetings**

The Member-Secretary briefed about the 45<sup>th</sup> meeting of the Working Group of NIH, which was held at NIH, Roorkee, during 11-12 May 2017, and the RCC meetings held at the different Regional Centres. During these meetings, the Working Group/RCC members reviewed the progress of studies for the year 2016-2017 and also discussed the proposed work programme for the year 2017-2018.

TAC noted the proceedings of the Working Group and RCC meetings.

#### **ITEM NO. 70.6: Work Programme for the Year 2017-2018**

The Member-Secretary briefed about the proposed work programme of the Institute for the year 2017-2018, which was discussed during the 45<sup>th</sup> Working Group meeting of NIH. The proposed work programme of the Regional Centres, as recommended by the respective RCCs, was also placed before the TAC.

The TAC approved the proposed work programme of the Institute for the year 2017-2018 (Appendix-II).

**ITEM NO. 70.7: Thrust areas of research proposed in EFC for 2017-20**

The thrust areas of research areas as proposed in the EFC Memo of NIH for the period 2017-2020 were noted by the TAC.

- JS(PP) opined that the list of thrust areas could be broadened as per requirements of the Ministry of Water Resources, RD & GR.
- Dr Ravinder Kaur mentioned that SPI drought indices are outdated and RS-based indices should be used.
- Member (D&R), CWC advised to focus on (i) issues of climate change impact on hydrological extremes, (ii) Project Hydrology, and (iii) studies on uncertainties and risks.

**ITEM NO. 70.8: Major projects and activities of national importance**

The TAC noted with satisfaction the NIH's involvement in the following projects and activities of national importance:

1. Integrated Hydrological Studies for Upper Ganga Basin up to Rishikesh (NMSHE)
2. National Hydrology Project (NHP)
  - Prof N K Goel wanted to know how educational institutions can be involved in the PDS.
  - For the 'Training and Capacity Building' component of NHP, the Chairman advised NIH to work in close collaboration with the National Water Academy, Pune. He also advised to consider modalities so that academic institutions may be closely associated with NHP works.
3. Neeranchal National Watershed Project (NNWP)
  - Dr Ravinder Kaur wanted to know the details of DSS-H.
4. Strategic Planning for Ganga River Basin
  - The Chairman advised to apprise the Secretary (WR) with the difficulties being faced while working with the Deltares model.
5. Research Collaboration with Centre for Ecology and Hydrology (CEH)
  - The Chairman enquired about the cost of establishing the proposed Indo-UK hydrological modeling centre at NIH. It was informed that broadly both partners will bear their own costs and NIH is not asking for additional staff.
  - Prof N K Goel informed that IIT Roorkee has also signed a MoU with CEH. The Chairman then advised that NIH and IITR may discuss further to avoid any duplicity.
6. WaterRain-Him: Changes in Water Resources and Adaptation options in the Indian-Himalayan basins.
7. State Specific Action Plan (SSAP) for Water Sector
  - Prof Jayakumar enquired if any template has been developed for preparing the reports by the states.
8. Water accounting exercise by MoWR, RD & GR

9. International Groundwater Conference-2017 (IGWC-2017) on “Groundwater Vision 2030: Water Security, Challenges and Climate Change Adaptation (New Delhi, December 2017)

**ITEM NO. 70.9: Establishing a Category-II UNESCO Centre at NIH**

The TAC appreciated the proposal of establishing a UNESCO Category-2 Centre at NIH in view of the felt need in the South Asian region, and gave in-principle recommendation to proceed further for establishing the Centre at NIH. He advised that NIH may also consult IIT Roorkee in this matter. The Centre’s title as Regional Centre on “Water and Environment” for South Asia was considered apt by the TAC to promote regional research, skill and capacity development, and outreach activities in the identified fields of hydrology, water resources and environment. The proposed UNESCO Centre will strengthen the activities of UNESCO-IHP in India, with its Secretariat already established at NIH.

**ITEM NO. 70.10: Road map to organize certificate courses at NIH**

The proposal of NIH to **organize few** short training courses on identified topics of hydrology and water resources was appreciated by the TAC. In view of the ongoing National Hydrology Project, and few other major water-related projects, a need exists for training and capacity building of the field engineers and practitioners on the modern techniques of investigations and on analysis and modeling. Moreover, the Government of India’s emphasis on the skill development also necessitates premier institutes like NIH to impart training to the young and mid-level practitioners to enable them taking up the flagship schemes and programmes of the government. The Member (D&R), CWC, suggested that in the proposed courses NIH could also focus on modern software tools. A combination of online, offline and virtual mode training courses could be planned. Chairman suggested that NIH may also consult with IIT Roorkee before taking up such training courses to avoid any duplicity.

**ITEM NO. 70.11: Reporting Items**

Details of the consultancy projects carried out by NIH during the year 2016-2017 were noted by the TAC.

The meeting ended with a vote of thanks to the Chair.

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**Appendix– I: List of Participants**

**Appendix– II: Approved Work Programme for the Year 2017-2018**

**LIST OF PARTICIPANTS OF THE 70<sup>th</sup> TAC MEETING OF NIH**

1. Er Narendra Kumar, Chairman, CWC, New Delhi
2. Er N K Mathur, Member (D&R), CWC
3. Er S K Sinha, Rep. Chief Engineer (HSO), CWC, New Delhi
4. Sh Sanjay Kundu, JS(PP), MoWR, RD & GR
5. Dr Sharad K Jain, Director, NIH, Roorkee
6. Sh K. B. Biswas, Chairman, CGWB, New Delhi
7. Prof N K Goel, IIT Roorkee
8. Prof K V Jayakumar, NIT Warangal
9. Prof K P Sudheer, IIT Madras
10. Dr Ravinder Kaur, Principal Scientist, WTC, ICAR-IARI, New Delhi
11. Dr V C Goyal, Sc. G & Member-Secretary, NIH, Roorkee

**INVITEES**

1. Dr N C Ghosh, Sc. G & Head, GWH Division, NIH, Roorkee
2. Dr Rakesh Kumar, Sc. G & Head, SWH Division, NIH, Roorkee
3. Dr C K Jain, Sc. G & Head, EH Division, NIH, Roorkee
4. Dr J V Tyagi, Sc. G, NIH, Roorkee
5. Er C P Kumar, Sc. G, NIH, Roorkee
6. Dr Sanjay Jain, Sc. G, NIH, Roorkee
7. Dr M K Goel, Sc. G, NIH, Roorkee
8. Dr Suhas Khobragade, Sc. F, NIH, Roorkee
9. Dr Sanjay Kumar, Sc. E, NIH, Roorkee
10. Dr M K Sharma, Sc. D, NIH, Roorkee
11. Dr J P Patra, Sc. C, NIH, Roorkee
12. Dr Jyoti Patil, Sc. C, NIH, Roorkee

**APPROVED WORK PROGRAMME FOR THE YEAR 2017-2018**

**ENVIRONMENTAL HYDROLOGY DIVISION  
Work Programme 2017-18**

<b>S.N.</b>	<b>Title of the Project</b>	<b>Team</b>	<b>Duration</b>	<b>Funding</b>
<b>I. Internal Studies (Ongoing)</b>				
1.	Development of Habitat Suitability Curves for the Aquatic Species of Western Himalayan Streams	Pradeep Kumar (PI) C. K. Jain	2 Years (04/16-03/18)	NIH
<b>II. Sponsored Projects (Ongoing)</b>				
1.	Ionic Enrichment Dynamics of Glacial Sediment and Melt water of Gangotri Glacier	M. K. Sharma (PI) C. K. Jain Renoj Thayyan Manohar Arora Naresh Saini Jatin Malhotra Rakesh Goyal Shyam Lal	3 Years (05/14-05/17)	DST (Rs 32.8 lakh)
2.	Environmental Assessment of Aquatic Ecosystem of Upper Ganga Basin	C. K. Jain (PI) Manohar Arora M. K. Sharma Pradeep Kumar D. S. Malik (GKU)	5 Years (04/16-03/21)	DST (Under NMSHE) (Rs 2.25 crore)

**GROUND WATER HYDROLOGY DIVISION  
Work Programme 2017-18**

<b>S. N.</b>	<b>Title of the project</b>	<b>Team</b>	<b>Duration</b>	<b>Funding</b>
<b>I. Internal Studies (Ongoing)</b>				
1.	Management of Water Resources for Quantity and Quality in Yamuna-Hindon Inter-basin	Anupma Sharma (PI), N.C. Ghosh (Coordinator), Deepak Kashyap, IITR (Technical Consultant) M K Sharma, R.P. Singh, Sumant Kumar, Shashi P. Indwar	3 years (12/14– 11/17)	NIH
2.	Groundwater fluctuations and conductivity monitoring in Punjab.	Gopal Krishan (PI), N.C. Ghosh, Surjeet Singh, C.P. Kumar Dan Lapworth (PI from UK) Alan MacDonald (Proj. Coord.)	2 year (01/16– 12/17)	NIH
3.	Web Enabled “Conjunctive Use Model for Management of Surface and Ground Water using concept of MAR and ASR”.	Suman Gurjar (PI), N.C. Ghosh, Sumant Kumar, Surjeet Singh, Anupma Sharma	1.5 Years (04/16– 09/17)	NIH

<b>II. Internal Studies (New)</b>				
1.	Feasibility of Managed Aquifer Recharge in NCT, Delhi	NIH-Roorkee (Lead) CGWB, New Delhi	6 months (2/17-7/17)	MoWR, RD & GR (under Plan Fund)
<b>III. Sponsored Projects (Ongoing)</b>				
1.	Peya Jal Suraksha - Development of Six Pilot Riverbank Filtration Demonstrating Schemes in Different Hydrogeological Settings for Sustainable Drinking Water Supply.	N.C. Ghosh (Project Coord. & Leader) C.P. Kumar, B. Chakraborty, Y.R.S. Rao, Anupma Sharma, Surjeet Singh, Sumant Kumar, Suman Gurjar, S.P. Indwar, R.P. Singh, Anju Choudhury, Sanjay Mittal, Ram Chandar, Staff SW Lab	3 year (11/15 – 4/18)	MoWR, RD & GR (under Plan Fund) (Rs. 375 lakh)
2.	Study of river - aquifer interactions and groundwater potential in the upper Ganga basin up to Dabrani.	Surjeet Singh (PI), N.C. Ghosh, R. J. Thayyen, S. P. Rai, Manohar Arora, Gopal Krishan,	5 year (03/16– 02/21)	DST (under NMSHE) (Rs. 125 lakh)
3.	<i>Country-wide Capacity Building Program on “Bank Filtration for Sustainable Drinking Water Supply”</i>	N. C. Ghosh, Lead Other Scientists of the division	2 years (02/16– 03/18)	DST (Rs. 38.4 lakh)
<b>IV. Sponsored Projects (New)</b>				
1.	Grey Water to Blue Water – Natural Treatment Techniques for Transforming Wastewater into Sustainable Useable Water	N.C. Ghosh (Project Leader), Anupma Sharma, Surjeet Singh, Sumant Kumar, Suman Gurjar, Anju Choudhury, Sanjay Mittal, Ram Chandar, Staff SW Lab - IIT Bombay (Partner) -UJS (Partner)	3 years (11/16- 10/19)	MoWR, RD & GR (under NWM) (Rs. 160.785 lakh)

**HYDROLOGICAL INVESTIGATIONS DIVISION**  
**Work Programme 2017-2018**

S.N.	Title of the Project	Team	Duration	Funding
<b>I. Internal Studies (Ongoing)</b>				
1.	Interaction between groundwater and seawater along the northern part of east coast of India	M. S. Rao (PI), Sudhir Kumar Pankaj Garg	2 years (08/15 - 03/18)	NIH
2	Lake-Groundwater Interaction Studies for Sukhna Lake, Chandigarh	S.D Khobragade (PI); Sudhir Kumar; S. P. Rai, Senthil Kumar; Pankaj Garg	3 years (04/15 – 03/18)	NIH
3	Radiocarbon dating of deeper groundwater of Indo-Gangetic Basin	M. S. Rao (PI) Sudhir Kumar	3 years (04/16 – 03/19)	NIH
4	Isotopic Investigations in parts of Upper Yamuna River Basin	S. K. Verma (PI), Sudhir Kumar, S P Rai, Mohar Singh, Vishal Gupta	2 years (04/16 – 03/18)	NIH
<b>II. Sponsored Projects (Ongoing)</b>				
1.	Understanding of hydrological processes in Upper Ganga basin by using isotopic techniques	S. P. Rai (PI); Sudhir Kumar; Rajesh Singh; M. Arora; Dr. R. J. Thayyen; Er. S. K. Verma	5 Years <i>04/16-03/21</i>	DST (Subproject No. 9 under NMSHE, 191.08 lakh)
2.	Dating vary old groundwaters of deeper aquifers in Ganga Plains, India	MS Rao, Sudhir Kumar S. P. Rai Sahas Khobragade	3 years <i>10/16 to 09/20</i>	IAEA Vienna (€ 18,000/-)
3	Rejuvenation of Springs and Spring-fed Streams in Mid-Himalayan Basin using Spring Sanctuary concept	Sudhir Kumar SP Rai	3 Years (04/16 -03/19)	Project with GBPIHE (15 lakhs)



**SURFACE WATER HYDROLOGY DIVISION**  
**Work Programme 2017-2018**

S. N.	Title of The Project	Team	Duration	Funding
<b>I. Internal studies (Ongoing)</b>				
1.	Generalization and parameter estimation of GEV distribution for flood analysis: Specific application on Indian data	Sushil K. Singh (PI)	1 year ( 04/16 - 09/17)	NIH
2.	Application and development of analytical models on data collected at NIH under Saph-Pani Project	Sushil K. Singh (PI)	3 years (04/16 - 03/19)	NIH
3.	Study of Rainfall Patterns and Comparison of Rainfall Data from different Sources for Uttarakhand State	Archana Sarkar (PI) Vaibhav Garg (IITR) Rakesh Kumar N.K. Bhatnagar	3 years (04/14 - 09/17)	NIH
4.	Snowmelt Runoff Modelling and Study of the Impact of Climate Change in Sharda River Basin	Achana Sarkar (PI) T. Thomas Vaibhav Garg (IITR)	3 years (04/15 - 03/18)	NIH
5.	Monitoring and modelling of streamflow for the Gangotri Glacier	Manohar Arora (PI) Rakesh Kumar	4years (05/14 - 03/18)	NIH
6.	Study on effect of climate change on sediment yield to Pong reservoir	A. R. Senthil Kumar (PI) J. V. Tyagi Avinash Agarwal Suhass Khobragade Manohar Arora	3 years (04/15 - 03/18)	NIH
7.	Effect of climate change on evaporation at point scale	Digambar Singh (PI) A. R. Senthil kumar Manohar Arora	3years (06/14 - 10/17)	NIH
8.	Flood and Sediment studies in Himalayan basin using MIKE-11 Model	A.K. Lohani (PI)	3 years (04/15 - 03/18)	NIH
9.	Snow cover variability in the Upper Yamnotri Basin	Naresh Kumar (PI) Manohar Arora Rakesh Kumar	2 years (04/16 - 06/18)	NIH
<b>II. Internal studies (New)</b>				
1.	Development and regionalization of unit hydrograph for runoff modeling on Indian catchments.	S.K. Singh (PI)	1 year (04/17 - 03/18)	NIH
2.	Development of regional relationships for water availability analysis and flood estimation for lower Godavari basin (3f).	Sanjay Kumar (PI) Rakesh Kumar J. P Patra Pankaj Mani	4 years (04/17 - 03/21)	NIH
3.	An integrated assessment of a middle Himalayan watershed for sustainability of its water resources.	A. R. Senthil Kumar (PI) Manohar Arora, Digambar Singh, M S Rao, R K Nema, Pradeep Kumar, S K Mishra (IITR)	3 years (04/17 - 03/20)	NIH

4.	Development of regional methods for design flood estimation in Uttarakhand.	J.P.Patra (PI) Rakesh Kumar Pankaj Mani Sanjay Kumar	3 years (04/17 - 03/20)	NIH
<b>III. Sponsored Projects (Ongoing)</b>				
1.	Hydrological modelling in Bhagirathi basin up to Tehri dam and assessment of climate change impact.	A. R. Senthil kumar (PI) J. V. Tyagi, M. K. Goel, S. D. Khobragade, P. C. Nayak, Manohar Arora, Digambar Singh.	5 Years 03/16 - 03/21	DST (under NMSHE) 58.256 Lakh
2.	Effect of Changing Global Tropospheric Temperature on Asia-Pacific Monsoon Circulation and Rainfall Fields across India.	Ashwini Ranade (PI)	3 years (04/14 - 11/17)	DST 12.6 Lakh
3.	WaterRain-Him: Change in water fluxes and adaptation options in the Indian-Himalayan fed basins.	<u>NIH Team:</u> Archana Sarkar (PI) Director, NIH Sanjay K. Jain  <u>Other Collaborators:</u> 1. SMHI, Sweden (Lead) 2. SEI, Sweden 3. IIT Delhi, India	3 years (2015-17 )	Swedish Research Council (VR), Sweden  NIH budget: SEK 188,000
4.	Modeling of Gangotri Glacier Melt Runoff and Simulation of Streamflow Variation under different Climatic Scenarios.	Manohar Arora (PI)	4 years (04/14- 03/18)	DST 47 Lakh
5.	Hydrological modeling in Alaknanda basin and assessment of climate change impact.	A. K. Lohani (PI) S. K. Jain V. S. Jaikanthan L. N. Thakral	5 Years 03/16 - 03/21	DST (under NMSHE) 42.296 Lakh
<b>IV. Sponsored Projects (New)</b>				
1.	GLORIOUS Copernicus Climate Change Service (C3S). ITT Ref.: C3S_422, Lot 1	<u>NIH Team:</u> Archana Sarkar (PI) Surjeet Singh, T. Thomas  <u>Other Collaborators:</u> (i) SMHI, Sweden (Lead) (ii) WU, The Netherlands (iii) CAS, The Netherlands (iv) HZG-GERICS, Germany (v) isardSAT Group, Spain (vi) AGRHYMET, Niger (vii) Australian Bureau of Meteorology (BOM) (viii) Meteodat, Switzerland (ix) MPI, Russia (x) NAWAPI, Vietnam (xi) NCWQR, USA	18 months 09/17 –02/18	European Centre for Medium Range Weather Forecast (ECMWF), UK  NIH budget: Euros 24,920

**WATER RESOURCES SYSTEM DIVISION**  
**Work Programme 2017-18**

S.N.	Title of the Project	Team	Duration	Funding
<b>I. Internal Studies (Ongoing)</b>				
1.	NIH_Basin – A WINDOWS based model for water resources assessment in a river basin	M. K. Goel (PI) Sharad K. Jain Deepa Chalisgaonkar P. K. Mishra	3 years (04/13-12/17)	NIH (16 lakh)
2.	Catchment scale evaluation of cold-arid cryospheric system Hydrology, Ganglass catchment, Ladakh	Renoj J. Thayyen (PI) S. P. Rai, Sanjay K Jain, Sudhir Kumar	3 years (04/14-03/18)	NIH (48 lakh)
3.	Hydrologic Modelling of a part of Satluj Basin using SWAT Model	P. K. Agarwal(PI) Sharad K. Jain, M. K. Goel, Sanjay K. Jain, M. K. Nema	4 years (06/14-03/18)	NIH (23 lakh)
4.	Decision Support System for Water Resources Planning in Upper Bhima basin, Maharashtra	D. S. Rathore (PI) M. K. Goel, R.P. Pandey, Sanjay Kumar, Surjeet Singh	2 years (07/14-12/17)	NIH (34 lakh)
5.	Modeling of Narmada basin by using the GWAVA model	T. Thomas (RC-Bhopal)(PI) P. K. Mishra, M. K. Nema, Sanjay K. Jain, Sharad K. Jain, P. K. Agarwal	2.25 years (12/14-03/18)	NIH
6.	Runoff modeling of Shyok River, Karakorum Range	Renoj J.Thayyen(PI) Sanjay K.Jain	3 years (12/14-12/17)	NIH (38 lakh)
7.	Hydrological process and characterization of Lesser Himalayan Catchments	M. K. Nema (PI) Sharad K. Jain, Sanjay K. Jain, Renoj J.Thayyen, P. K. Mishra, P. K. Agarwal	5 Years (12/14-12/19)	NIH (90.55)
8.	Development of Ganga Information Portal	Deepa Chalisgaonkar (PI) Sharad K. Jain, D. S. Rathore, Sanjay K. Jain, Sudhir Kumar, P. K. Mishra, P. K. Agarwal, M. K. Nema	3 years (04/15-03/18)	MoWR (under NIH Plan funds) (65.55 lakh)
9.	Study of hydrological changes in selected watersheds in view of climate change in India.	L. N. Thakural(PI) D. S. Rathore, Surjeet Singh, Sanjay K. Jain, Sharad K. Jain	3 years (04/15-03/18)	MoWR (under NIH Plan funds) (44.30 lakh)
<b>II. Sponsored Projects (Ongoing)</b>				
1.	Mass and Energy balance of Phuiche and Khardung glaciers, Ladakh range	R.J. Thayyen(PI) Farooq Azam P.G. Jose A.P. Dimri (JNU)	3 years (03/16-02/19)	SERB (65.14 lakh)

2.	Development of a project website and hydrological database in Upper Ganga Basin <b>(Sub-project – 1)</b>	M. K. Goel (PI) M. Arora, A. K. Lohani, D. S. Rathore, Mrs. D. Chalisgaonkar, A. R. S. Kumar, Surjeet Singh, P. Mani, A. Sarkar, M. K. Nema, P. K. Mishra	5 years (01/16-12/20)	DST (under NMSHE) (52.15 lakh)
3.	Real-time snow cover information system for Upper Ganga basin <b>(Sub-project – 2)</b>	D. S. Rathore (PI) Mrs. D. Chalisgaonkar V. S. Jeyakanthan L. N. Thakural	5 years (01/16-12/20)	DST (under NMSHE) (48.83 lakh)
4.	Glacial Lakes & Glacial Lake Outburst Flood (GLOF) in Western Himalayan Region <b>(Sub-project – 3)</b>	Sanjay K. Jain (PI) A. K. Lohani Sudhir Kumar P. Thakur (IIRS)	5 years (01/16-12/20)	DST (under NMSHE) (36.79 lakh)
5.	Assessment of downstream impact of Gangotri glacier system at Dabrani and future runoff variations under climate change scenarios <b>(Sub-project – 4)</b>	R. J.Thayyen (PI) Sanjay K. Jain, Sharad K. Jain, S. P. Rai, P. K. Mishra, M. Arora, AP Dimri(JNU)	5 years (01/16-12/20)	DST (under NMSHE) 51.43 (NIH) + 28.29 (JNU)
6.	Observation and modelling of various hydrological processes in a small watershed in Upper Ganga basin <b>(Sub-project – 5)</b>	Sharad K. Jain (PI) Renoj J.Thayyen, Sanjay K. Jain, S. P. Rai, Surjeet Singh, M. K. Nema,P. K. Mishra, P. K. Agarwal, AP Dimri (JNU)	5 years (01/16-12/20)	DST (under NMSHE) (54.07 lakh)
7.	Water Census and Hotspot analysis in selected villages in Upper Ganga basin <b>(Sub-project – 11)</b>	P. K. Mishra(PI) M. K. Nema, R. J. Thayyen, P. K. Sachan	5 years (01/16-12/20)	DST (under NMSHE) (90.99 lakh)
1.	Mass and Energy balance of Phuiche and Khardung glaciers, Ladakh range	R.J. Thayyen(PI) Farooq Azam, P.G. Jose, A.P. Dimri (JNU)	3 years (03/16-02/19)	SERB (65.14 lakh)
<b>III. Sponsored Projects (New)</b>				
1.	Dynamics of Himalayan Ecosystem and its impact under changing climate scenario-Western Himalaya	R. J.Thayyen (PI) P. K. Mishra	3 years (03/17-03/20)	MoEF (58.76 lakh)
2.	Sustaining Himalayan Water Resources in a Changing Climate (SusHi-Wat)”	Sanjay K Jain (PI) Sharad K Jain Jointly with IITR	3 Years (01/17-01/20)	MoES (21.202 Lakhs)
3.	Design and development of generic Decision Support System-Hydrology platform for Neeranchal Project	D. S. Rathore (PI) Deepa Chalisgaonkar Jyoti Patil	1 year (04/17-03/18)	DoLR (under NNWP)

**RESEARCH MANAGEMENT AND OUTREACH DIVISION (RMOD)**  
**Work Programme 2017-18**

SN	Title of Project	Team	Duration	Funding
<b>I. Internal Studies (Ongoing)</b>				
1	Development of IWRM Plan for Ibrahim-Masahi village (Haridwar district) <b>(Ongoing)</b>	Omkar Singh (PI), V C Goyal, Dinesh Kumar	04/13-09/17	NIH
<b>II. Sponsored Projects (Ongoing)</b>				
2	Development of IWRM Plan for identified watersheds in Jhansi, Lalitpur and Chhatarpur districts <b>(Ongoing)</b>	<b>NIH:</b> V C Goyal (PI), Jyoti Patil <b>MPCST:</b> Sandeep Goyal, Rajesh Saxena <b>UP-RSAC:</b> Rajiva Mohan, Sudhakar Shukla	04/16- 03/18	MoWR, RD & GR (under NIH Plan funds)
<b>III. Sponsored Projects (New)</b>				
3	Rejuvenation of village ponds for identified villages in Muzaffarnagar and Meerut districts	V C Goyal (PI), Dinesh Kumar, Omkar Singh, Digamber Singh	04/17- 03/20	MoWR, RD & GR (Rs 830 lakh)
4	Vulnerability assessment of identified watersheds in Neeranchal Project States	Jyoti P Patil + RCs	07/17- 06/19	DoLR (under NNWP)

**REGIONAL CENTRE, BELGAUM**  
**Work Programme 2017-2018**

S.N.	Title of the Project	Team	Duration	Funding
<b>I. Internal Studies (New)</b>				
1	Climate Change Adaptation Framework for Water Resources Management for Malaprabha River Basin in Karnataka	B Venkatesh, (PI) MK Jose, PC Nayak, T Thomas & Sc. HRRC B Venkatesh, (PI) PC Nayat, T Thomas, & Sc. of HRRC (In association with WRDO, Govt. Karnataka)	3 years (4/17-3/20)	NHP
2	Sustainability of Spring flows in parts of Western Ghats, India	BK Purandara (PI) & Sc. HRRC, (In association with WRDO, Govt. Karnataka)	3 years (4/17-3/20)	NHP
3	Water balance estimation in selected watersheds of Amaravati and Ahmednagar districts of Maharashtra	Chandramohan T (PI) M.K. Jose Venkatesh.B	One year (2017-18)	DoLR (NNWP)

4	Water balance estimation in selected watersheds of Nalgonda and Mehboob nagar districts of Telangana	M.K. Jose (PI) Chandramohan T Venkatesh.B	One year (2017-18)	DoLR (NNWP)
<b>II. Sponsored Projects (Ongoing)</b>				
1.	Clean and safe drinking water supply to rural community using river bank filtration techniques in hard rock regions of Krishna basin, Karnataka, India.	BK Purandara (PI), Sudhir Kumar, Sc G	3 years (4/16- 3/19)	DST (95 lakhs)

**REGIONAL CENTRE, JAMMU**  
**Work Programme 2017-18**

S. N.	Title of Study	Team	Duration	Funding
<b>I. Internal Studies (Ongoing)</b>				
1.	PBS: Integrated Water Resources Management (IWRM) Study in Tawi River Basin, JK	P Kumar (PI) S S Rawat	05 years (04/12-8/17)	NIH
2.	Hydrological Investigation of Natural Water Springs of Baan Ganga watershed in Jammu & Kashmir State	S S Rawat (PI) P Kumar S P Rai R V Kale	03 years (05/15-03/18)	NIH
<b>II. Internal Studies (New)</b>				
1.	Performance evaluation of 2D-VPMM and 2D-explicit schemes for two-dimensional overland flow simulation.	R V Kale (PI) M K Goel	1.5 years (04/17 - 08/18)	NIH

**REGIONAL CENTRE, BHOPAL**  
**Work Programme 2017-18**

S.N.	Title of the Project	Team	Duration	Funding
<b>I. Internal Studies (Ongoing)</b>				
1.	Development of DSS for Bina river basin in Bundelkand region in M.P. using WEAP Model (under PBS)	T.R. Nayak (PI) R.V. Galkate T.Thomas R.K. Jaiswal Shashi P. Indwar	2 ¼ Years (04/15-07/17)	NIH
2.	Surface and ground water modeling for conjunctive use (under Pilot Basin Studies)	T.R. Nayak (PI) R.V. Galkate T.Thomas R.K. Jaiswal Shashi P. Indwar	2 ¼ Years (04/14-07/17)	NIH
3	Estimation of revised capacities of reservoirs in Chhattisgarh state using Digital Image Processing	R.K. Jaiswal (PI) R.V. Galkate T.Thomas R.K. Jaiswal	2 ¼ Years 04/15-09/17	NIH

	technique	Shashi P. Indwar		
4	Groundwater flow modeling in upper Bina river watershed in Bina block	S.P. Indwar (PI) R.V. Galkate T.Thomas R.K. Jaiswal Shashi P. Indwar	1 ½ Years 10/16-09/17	NIH
<b>II. Sponsored Projects (Ongoing)</b>				
1	IWRM based Development Plan for Water Security in the Four Districts of Bundelkhand Region in India	V. C. Goyal (PI) Omkar Singh T. R. Nayak T. Thomas R. V. Galkate R. K. Jaswal Jyoti Patil	1¼ Years 07/16 – 09/17	MoWR, RD, GR (under NIH Plan funds)  Rs. 300 lakhs
<b>III. Sponsored Projects (New)</b>				
1	Water balance estimation in identified watersheds of Jashpur and Kanker districts of Chhattisgarh	T.R. Nayak (PI)	3 Years (04/17-03/20)	DoLR (under NNWP)
2	Water balance estimation in identified watersheds of Dewas and Jabalpur districts of Madhya Pradesh	R.V. Galkate (PI)	3 Years (04/17-03/20)	DoLR (under NNWP)
3	Water balance estimation in identified watersheds of Kuchch and Surendra Nagar districts of Gujarat	T.Thomas (PI)	3 Years (04/17-03/20)	DoLR (under NNWP)
4	Water balance estimation in identified watersheds of Jodhpur and Udaipur districts of Rajasthan	R.K. Jaiswal (PI)	3 Years (04/17-03/20)	DoLR (under NNWP)
5	Revival of Village Ponds through Scientific Interventions in Sagar District	T. Thomas (PI) Jyoti Patil Sandeep Goyal (MPCST) V. K. Bhatt (WALMI)	2 Years (07/17-06/19)	DST Rs. 28.82 lakhs
6	Evaluation of impacts of Rabi irrigation in Ganga river sub basin of Madhya Pradesh	R.V. Galkate, (PI) R.K. Jaiswal, T.R. Nayak, T. Thomas, Shashi P. Indwar,	3 years	PDS (under NHP) (Rs. 41.5 Lakh)

**REGIONAL CENTRE, KAKINADA**  
**Work Programme 2017 – 2018**

S.N.	Title of the Project	Team	Duration	Funding
<b>I. Internal Studies (New)</b>				
1	Hydrological Evaluation and Modeling for Water Resources Management in Lower Mahanadi basin in Odisha State	P. C. Nayak (PI) Sharad Jain, N.C. Ghosh, J. V. Tyagi, Y. R. Satyaji Rao, S. V. Vijayakumar B. Venkatesh V. S. Jeyakanthan T. Thomas R. Venkatramana, Prabhash Mishra	5 years (08/17-07/22)	NHP PDS (Rs.2.44 crore)
<b>II. Sponsored Projects (Ongoing)</b>				
1.	Water balance estimation in identified watersheds of Anantpur and Chittoor districts of Andhra Pradesh	Y. R. Satyaji Rao V.S.Jeyakanthan R. Venkata Ramana	18 months (03/17-08/18)	DoLR (under NNWP)
2.	Water balance estimation in identified watersheds of Mayurbhanj and Kandhmal districts of Odisha	Y. R. Satyaji Rao V.S.Jeyakanthan R. Venkata Ramana	18 months (03/17-08/18)	DoLR (under NNWP)
3.	Real-time snow cover information system	V. S. Jeyakanthan	05 Years (2016-2021)	DST (under NMSHE)
4.	Hydrological modeling in Alaknanda basin and assessment of climate change impact	V. S. Jeyakanthan	05 Years (2016-2021)	DST (under NMSHE)

**CFMS, GUWAHATI**  
**Work Programme 2017-18**

S.N.	Title of the Project	Team	Duration	Funding
<b>I Internal Studies (Ongoing)</b>				
1.	Application of USLE Model for Estimation of Soil Loss in Kulsi River Basin using Remote Sensing and Geographic Information System	Gulshan Tirkey (PI) S. K. Sharma	1 year (04/16-03/17) Extended for 2017-18	NIH
<b>II Internal Studies (New)</b>				
1.	Evaluation of Ground Water Quality with more Emphasis on Arsenic Contamination in Barpeta District of Assam	C. K. Jain (PI) S. K. Sharma Babita Sharma	1 year (04/17-03/18)	NIH
2.	Evaluation of Ground Water Quality in Shillong– the Capital City of Meghalaya	C. K. Jain (PI) M. B. Ritshong (SE, WRD, Meghalaya) S. K. Sharma Babita Sharma	1 year (04/17-03/18)	NIH



3.	Distribution and Risk Assessment of Heavy Metal Pollution in Surface Soils of Guwahati (Assam)	C. K. Jain (PI) S. K. Sharma Upma Vats	1 year (04/17-03/18)	NIH
4.	Estimation of Runoff for Kulsu River Basin using NRCS Curve Number and Geographic Information System	S. K. Sharma (PI) Gulshan Tirkey	2 years (04/17-03/19)	NIH
5.	Morphometric Analysis of Kulsu Basin using different Digital Elevation Models (DEMs)	Gulshan Tirkey (PI) S. K. Sharma	1 year (04/17-03/18)	NIH

**CFMS, PATNA**  
**Work Programme 2017-18**

S.N.	Title of the Project	Team	Duration	Funding
<b>I. Internal Studies (Ongoing)</b>				
1.	Development of Relationships between Reference Evapotranspiration (ET <sub>o</sub> ) of Penman-Monteith and other Climatological methods	S.R. Kumar (PI)	3 years (04/16-03/19)	NIH
<b>II. Sponsored Projects (Ongoing)</b>				
1.	Demonstration scheme on Riverbank Filtration in Gangetic plain of Bihar	B. Chakravorty (PI) N. G. Pandey	2 years (02/16-02/18)	MoWR (under NIH Plan funds),
2.	River shifting analysis and flow modelling study of Ganga river from Rishikesh to Anupshahar	Pankaj Mani (PI) Rakesh Kumar, J. P. Patra	3 years (04/16-03/19)	MoWR (under NIH Plan funds),
<b>III. Sponsored Projects (New)</b>				
1.	Water balance estimation in identified watersheds of Ranchi and Dhanbad districts of Jharkhand	B. Chakravorty (PI) N. G. Pandey	2 Years (04/17-03/19)	DoLR (under NNWP)