

**AGENDA AND AGENDA NOTES
76th MEETING OF THE
TECHNICAL ADVISORY COMMITTEE (TAC) OF NIH**

**29th August 2022
at 1500 Hrs
Venue: Society Room, NIH, Roorkee**



**NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE-247667**

AGENDA AND AGENDA NOTES FOR THE 76th MEETING OF THE TAC OF NIH

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ITEM # 76.1**Opening Remarks by the Chairman****ITEM # 76.2****Confirmation of the minutes of 75th meeting of the TAC**

The 75th meeting of the TAC was held at Roorkee on Sept.1, 2021 in VC mode. The minutes of the meeting were circulated to all the members and invitees vide email dated Sept.22, 2021. A copy of the minutes of the 75th meeting of TAC is given in **Appendix-76.2.1[Page # 1 (Vol.-II)]**. Since no comments were received from the members on the circulated minutes, the minutes may please be confirmed.

ITEM # 76.3:**Action taken on the decisions/ recommendations in the previous meeting**

S N	Query/Suggestion	Action Taken
1	Item#75.3- The members advised that pending the creation of a post of Documentation Officer, a consultant may be hired to initiate the compilation of hydrologic research in India on an identified topic, such as the theme of World Water Day-2021 i.e. Valuing Water, or Impact of Climate Change on Water Resources, as suggested by the Director, NIH	Shall be advertised after obtaining permission from the competent authority
2	Item#75.4- (i) Prof Arup Sarma suggested to improve land productivity and examine its impact on water productivity, (ii) The chair advised to send the report of the study "Real time flood modelling using HEC-RTS modelling framework (PI: Dr Vishal Singh, WRSD)" to CWC, (iii) Prof Arup Sarma mentioned that (in this study) the forecasting uncertainties and associated risks should be verified with river cross-section data.	(i) Noted for compliance (ii) The report has been sent to the Chairman, CWC (iii) Uncertainty estimation and bias correction of met data (e.g. rainfall) has been carried out. Measured cross sections at the desired interval were not available and thus the available cross-sections were utilized to correct the DEM derived cross sections.
3	Item#75.5- Dr Wani suggested compilation of a concept note on hydrological inputs as applicable to IDEA and make it available to various stakeholders, and on NIH website/portal	After checking the IDEA website, nothing relevant to hydrological research was found.

ITEM # 76.4: Status of the work programme for the year 2021-22

I. List of Completed studies

S. No	Title of the project	PI	Division	Internal/Sponsored
1.	Water quality assessment of Haridwar District	R.K. Nema	EHD	Internal
2.	Upgradation of NIH_ReSyP to .NET Platform– a Reservoir Operation Package	M. K. Goel	GWHD	Internal
3.	Hydrological investigations of selected springs in Tehri Garhwal District , Uttarakhand	S M Pingale	HID	Internal
4.	Assessment of Climate Change Impact on Water Availability and Agriculture in part of Banas basin	Archana Sarkar	SWHD	Internal
5.	Evaluation of seasonal extreme rain events across river basins of India in 3D global temperature change scenario.	Ashwini Ranade	SWHD	Internal
6.	Evaluation of the influence of low-frequency atmosphere-ocean oscillations on annual floods in the watersheds of the Indian subcontinent	Sunil Gurrapu	SWHD	Internal
7.	Evaluation of the Influence of low frequency atmosphere-Ocean Oscillations on Annual Floods in Godavari and Narmada River Banks	Sunil Gurrapu	SWHD	Internal
8.	Application of unified-extreme-value (UEV) distribution for flood frequency: (1) Mahi & Sabermati subzone – 3a (2) Godavari subzone-3e.	S.K. Singh	SWHD	Internal
9.	Application of generalized unified-extreme-value (GUEV) distribution for flood frequency: Upper Godavari subzone-3e	S K Singh	SWHD	Internal
10.	Application of generalized unified-extreme-value (GUEV) distribution for flood frequency: Mahi & Sabatmati Subzone-3a	S K Singh	SWHD	Internal
11.	Conservation of ponds in Ibrahimpur- Masahi Village and performance evaluation of natural treatment system	Omkar Singh	RMOD	Internal
12.	Development of Prediction Tools for Assessment of Water Resources in Ungauged Catchments of West Flowing Rivers of Western Ghats Region	Chandramohan T	Belgavi	Internal
13.	Climate Change Impact assessment for Jayakwadi Reservoir	B Venkatesh	Belgavi	Internal
14.	Flood Vulnerability Assessment and developing mitigation plan for Thiruvananthapuram City, Kerala	Chandramohan T	Belgavi	Internal
15.	Hydrologic and hydraulic modelling for floodplain inundation mapping under future climate change scenarios: A case study of Tawi River, India.	R. V. Kale	Jammu	Internal

16.	Statistical evaluation of global precipitation estimates over data scarce Western Himalayan Region of India	D. S. Bisht	Jammu	Internal
17.	Impact of Climate Change on Runoff and Sediment Yield for a Major Tributary of River Brahmaputra	Swapnali Barman	Guwahati	Internal
18.	Groundwater Quality Assessment of Morigaon district of Assam with emphasis on Arsenic & Fluoride Contamination	S.K. Sharma	Guwahati	Internal
19.	Hydrological Behaviour of two mid-sized Mountainous Catchments under the influence of Climate and Land Use Changes	W Rahul Singh	Guwahati	Internal
20.	Performance evaluation of Upper Morhor Canal System of South Bihar	NG Pandey(PI) B Chakravorty	Patna	Internal
21.	Water Quality Assessment of Southwest Punjab Emphasizing Carcinogenic Contaminants and their Possible Remedial Measures	Rajesh Singh	EHD	Sponsored
22.	Water Efficient Irrigation by Using SCADA System For Medium Irrigation Project (Mip) Shahnehar	R.P. Pandey (2/22)	EHD	Sponsored
23.	Future Secular Changes and Remediation of Groundwater Arsenic in the Ganga River Basin - FAR GANGA	B. Chakravorty (India Lead), Surjeet Singh (Dy. Lead),	GWHD	Sponsored
24.	Impact of Rainwater Harvesting on Groundwater Quality in India with Specific Reference to Fluoride and Micro-pollutants	Anupma Sharma (India Lead),	GWHD	Sponsored
25.	Development of a project website and hydrological database in Upper Ganga basin (SP-1)	M. K. Goel	GWHD	Sponsored
26.	Understanding of hydrological processes in Upper Ganga basin by using isotopic techniques	Suhas Khobragade	HID	Sponsored
27.	Unravelling Submarine Discharge (SGD) zones along the Indian subcontinent and its islands (Mission SGD) – Pilot Study	Sudhir Kumar	HID	Sponsored
28.	Hydrological modelling in Alaknanda basin and assessment of climate change impact(NMSHE)	A.K.Lohani	SWHD	Sponsored
29.	Rainfall-Runoff Modelling of Selected Basin based on LULC pattern and development of Correlation (NHP)	A.K. Lohani	SWHD	Sponsored
30.	Investigating Water Stress using Hydro-meteorological and Remote Sensing data	L. N. Thakural	SWHD	Sponsored
31.	Real-time snow cover information system for Upper Ganga basin (Sub-project – 2)	V. S. Jeyakanthan L. N. Thakural	WRSD	Sponsored
32.	Glacial Lakes & Glacial Lake Outburst Flood (GLOF) in Western Himalayan Region (Sub-project – 3)	Sanjay K. Jain	WRSD	Sponsored
33.	Assessment of downstream impact of Gangotri glacier system at Dabrani and future runoff variations under climate change scenarios	Sanjay K. Jain	WRSD	Sponsored

	(Sub-project – 4)			
34.	Observation and modelling of various hydrological processes in a small watershed in Upper Ganga basin (Sub-project – 5)	M K Nema	WRSD	Sponsored
35.	Water Census and Hotspot analysis in selected villages in Upper Ganga basin (Sub-project – 11)	P. K. Mishra	WRSD	Sponsored
36.	Hydrological modelling in Bhagirathi basin up to Tehri dam and assessment of climate change impact	A R Senthil Kumar	RMOD	Sponsored
37.	Preparation of Guidebook on S&T Interventions on Pond Rejuvenation	V C Goyal Jyoti Patil	RMOD	Sponsored
38.	Estimation of Submarine Groundwater Discharge in Parts of Karnataka	BK Purandara (PI), Sudhir Kumar	Belgavi	Sponsored
39.	Evaluation of impact of Rabi irrigation in Ganga River sub- basin of Madhya Pradesh	R. V. Galkate	Bhopal	Sponsored
40.	Groundwater salinity source identification in Godavari delta, Andhra Pradesh	Y.R.Satyaji Rao	Kakinada	Sponsored
41.	Study of the behaviour of Multi-Aquifer system & Aquifer mapping for an effective Groundwater Management in Gunderu Sub-Basin, West Godavari district, AP	S.V.Vijaya Kumar	Kakinada	Sponsored
42.	Unravelling Submarine Groundwater Discharge (SGD) Zones along A.P and Odisha States (Mission SGD)-Pilot Study	Y.R. Satyaji Rao	Kakinada	Sponsored
43.	River basin planning studies in Teesta basin up to confluence with Rangit River in Sikkim	Swapnali Barman (2/22)	Guwahati	Sponsored

II. Presentation of completed studies:

- a) Statistical evaluation of Global precipitation estimates over data scares Western Himalayan region of India – **Shri D.S. Bisht, Scientist 'B'**
- b) Water Quality Assessment of South West Punjab emphasizing Carcinogenic Contaminants and their possible Remedial Measures - **Dr. Rajesh Singh, Sc. 'D'**
- c) Evaluation of the influence of low frequency atmosphere ocean oscillations on annual floods in Godavari and Narmada river banks - **Dr. Sunil Gurrapu, Sc. C**

ITEM # 76.5: Report of proceedings of the Working Group and RCC Meetings

The 52nd meeting of the Working Group of NIH was held during 12-13 April 2022. The Working Group considered the status of the work programme for the year 2021-22 under two categories: (i) internally funded projects, and (ii) sponsored/consultancy projects. The approved minutes of the 52nd meeting of the NIH Working Group are given in **Appendix 76.5.1 [Page # 411 (Vol.-II)]**.

General comments/suggestions by the members during the 52nd meeting of WG are as follows:

- Avoid duplication and redundant studies
- Collaboration with CWRDM
- Climate change impact in coastal areas
- Work on water footprint, Early Warning Systems
- Explore copyright for software
- Improve presentation skills
- Exhaustive literature survey needed before proposing a new study
- Upload work program on NIH website
- Link scientists at NIH RCs through VC
- Focus on groundwater in Kandi areas in Punjab and Haryana
- Studies should be outcome based
- Any new study should address 'Why' and 'How', and must include literature survey
- Explore patents, innovations; involve water industry
- Improve presentation skills- rehearsal by presenters
- Bring out impact of completed studies
- Research should be society oriented/useful for society
- Focus of drinking water studies
- Strengthen outreach activities
- Time period of studies should not be too long
- Reduce long study periods
- Field studies addressing water quality should have suggestions for mitigation and/or adaptation

Comments/suggestions on specific studies are incorporated in the Work Program tables.

RCC meetings

DRC, Kakinada	-	31th RCC – 05 July, 2022
CFMS, Patna	-	21st RCC – 05 May, 2022
CIHRC, Bhopal	-	20th RCC – 09 May, 2022
HRRC, Belagavi	-	32nd RCC – 10 June, 2022
WHRC, Jammu	-	26th RCC – 27 May, 2022
NERC, Guwahati	-	17th RCC – 24 June, 2022

The TAC may please note the proceedings of the meetings of the Working Group and RCC.

Division	No. of Studies/Projects During the Year 2021-22				
	Ongoing		New		Total
	Internally funded	Sponsored	Internally funded	Sponsored	
Environmental Hydrology	3	3	1	1	8
Ground Water Hydrology	1	9	-	-	10
Hydrologic Investigation	2	9	2	-	13
Surface Water Hydrology	4	2	2	-	8
Water Resources System	4	11	-	3	18
Research Management & Outreach	4	3	-	-	7
HRRC, Belagavi	3	2	1	-	6
WHRC, Jammu	3	2	3	1	9
CIHRC, Bhopal	2	5	2	-	9
DRC, Kakinada	-	6	1	-	7
NERC, Guwahati	5	2	-	1	8
CFMS, Patna	2	-	1	1	4
Total	33	54	13	7	107

ITEM # 76.6: Work Programme for the year 2022-23

The approved Work Programme of the Divisions at the Headquarters and RC/CFMS of the Institute for the year 2022-23 is given in the tables below, and details are provided in **Appendix 76.6.1 [Page # 21 (Vol.-II)]**:

1. Environmental Hydrology Division
2. Ground Water Hydrology Division
3. Hydrological Investigation Division
4. Surface Water Hydrology Division
5. Water Resources Systems Division
6. Research Management & Outreach Division
7. Hard Rock Regional Centre, Belagavi
8. Western Himalayan Regional Centre, Jammu
9. Central India Hydrology Regional Centre, Bhopal

10. Deltaic Regional Centre, Kakinada
11. NIH-North Eastern Regional Centre, Guwahati
12. CFMS (Ganga Basin), Patna

The number of studies/projects handled by each Division under different categories are given below:

Division	No. of Studies/Projects During the Year 2022-23					
	New		Ongoing		Total	Consultancy Projects
	Internally funded	Sponsored	Internally funded	Sponsored		
Environmental Hydrology	1	-	3	3	7	2
Ground Water Hydrology	3	1	1	7	12	1
Hydrologic Investigation	1	-	2	7	10	-
Surface Water Hydrology	9	-	2	1	12	-
Water Resources System	1	2	3	5	11	-
Research Management & Outreach	1	-	3	1	5	-
HRRC, Belagavi	1	1	-	2	4	-
WHRC, Jammu	1	-	4	3	8	-
CIHRC, Bhopal	-	1	4	4	9	-
DRC, Kakinada	1	1	1	2	5	-
NERC, Guwahati	2	-	2	3	7	-
CFMS, Patna	-	1	2	1	4	-
Total	21	7	27	39	94	3

ENVIRONMENTAL HYDROLOGY DIVISION

Recommended Work Programme for the Year 2022-23

SN	Study	Study Team	Duration/Status
Sponsored Projects (Ongoing)			
1.	Water Efficient Irrigation by Using SCADA System For Medium Irrigation Project (MIP) Shahnehar	Dr. R.P. Pandey, (PI). Er. Jagdeesh Patra, Dr. Rajesh Singh, Sh N. K. Bhatnagar,	3 years (12/17-12/20) Extension requested till 03/22 Project cost: Rs. 75.0 Lakh Status: In-progress
2.	Isotopic and geochemical approach to study vulnerable confined and unconfined drinking water aquifers in Varanasi and surrounding area	Rajesh Singh (PI) R. P. Pandey BHU, Varanasi (Lead) Other Collaborators: BARC, Mumbai, ICER, Hungary	3 years (07/21-07/24) Project cost: Rs. 10.0 Lakh Sponsored by: BHU Status: In-progress
Internal Study (Ongoing)			
3.	Simulation of Non-Point Source Pollution Processes in Song River	Pradeep Kumar (PI) J. V. Tyagi M. K. Sharma Rajesh Singh R. K. Nema	4 years (11/19-10/23) Project cost: Rs. 43.02 lakh Status: In-progress
4.	Influence of Anthropogenic Factors on River Ganga in the stretch from Rishikesh to Haridwar	Rajesh Singh (PI) J. V. Tyagi R. P. Pandey R.K. Nema Pradeep Kumar M. K. Sharma	2 Years (06/20-05/22) Project cost: Rs. 23.71 Lakh Sponsored by: Internal Status: In-progress
5.	Understanding Arsenic mobilization in groundwater of Haridwar and formulating remediation measures	Rajesh Singh (PI) R. K. Nema Sumant Kumar Pradeep Kumar M. K. Sharma	3 Years (07/21 – 06/24) Project Cost: 30.1 Lakhs Sponsored by: Internally Status: In-Progress
Internal Study (New)			
6.	Characterisation of Groundwater Dynamics in Krishna-Godavari Delta interims of groundwater levels, Hydrochemistry, Isotopes and Emerging Contaminants	M. K. Sharma (PI) RC, Kakinanda CGWB	2 years (04/22-03/24) Sponsored by: Internally Status: Proposed
Consultancy Projects			
7.	Estimation of Economic Losses in Real Terms per Hectare Basis due to Forest Fire in Uttarakhand and Madhya Pradesh	J. V. Tyagi (Lead PI) R. P. Pandey (PI) P. Kumar (Co-PI) T. Thomas (Co-PI) L. N. Thakural P. K. Singh Rajesh Singh	2.5 Years (03/20-08/22) Sponsored by: ICFRE Project Cost: Rs. 1.1033 Crore Status: In-progress

8.	Estimation of Sediment Load and GHG Emission from Reservoir of Chamera-I Power Station, NHPC	J.V. Tyagi R.P. Pandey Rajesh Singh (PI) M. K. Sharma	15 months (09/21-03/23) Project Cost: Rs. 3,24,500/- Sponsored by: CPWD Dehradun Status: In-progress
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Proposed Training Programmes for 2022-23

SN	Topic	Duration	Place
1.	Water Quality: Concepts and Analysis under NHP for IRI officials (Coordinator: Dr. M. K. Sharma)	5 Days	Roorkee
2.	Estimation of Recharge for improving the Water Quality using MODFLOW & MT3D under NHP (Coordinator: Dr. M. K. Sharma)	5 Days	Roorkee
3.	Water Quality Assessment & Management under NHP-PDS (Coordinator: Dr. Rajesh Singh)	5 Days	Roorkee
4.	Water Quality Data Processing (Coordinator: Dr. Pradeep Kumar)	5 Days	Roorkee
5.	Leachate Transport in Groundwater under NHP-PDS (Coordinator: Ms. Anjali)	5 Days	Roorkee

GROUND WATER HYDROLOGY DIVISION

Recommended Work Program for the year 2022-23

S. No.	Project	Project Team	Duration & Status	Funding Source
Internal Studies				
1. NIH/GWH/NIH/ 20-22	Integrated GEE-MODFLOW based Groundwater Recharge Assessment System for Hindon River System	Nitesh Patidar (PI), Gopal Krishan Anupma Sharma	2 years (08/20 – 07/22) <i>Status: In progress</i>	Internal Study
2. NIH/GWH/NIH/ 22-25	Studying arsenic genesis and developing alternate water supply management strategies in Ganga basin	Sumant Kumar (PI), S. Singh, R. Singh, G. Krishan, S. S. Rawat, M.K. Sharma, N. Patidar, P. K. Mishra, M. K. Goel	3 years (04/22 – 03/25) Status: New Study	Internal Study
3. NIH/GWH/NIH/ 22-24	Conjunctive Management of Water Resources in IGNP Command	Nitesh Patidar (PI), M. K. Goel, Anupma Sharma, Gopal Krishan, Surjeet Singh, Sumant Kumar, Nidhi Kalyani	2 years (04/22 – 03/24) Status: New Study	Internal Study
4. NIH/GWH/NIH/ 22-24	Studying Groundwater Dynamics using Machine Learning and Numerical Modelling	Nidhi Kalyani (PI), Anupma Sharma, Nitesh Patidar, Sumant Kumar	2 years (04/22 – 03/24) Status: New Study	Internal Study
Sponsored Projects				
5. NIH/GWH/BGS/ 17-20	Groundwater Fluctuations and Conductivity Monitoring in Punjab - Groundwater resilience in Punjab and adaptation to future changes in climate and water resource demands (title modified by funding agency)	Gopal Krishan (PI), S. Singh, C. P. Kumar (retd.), M. S. Rao <i>BGS, UK:</i> Dan Lapworth Alan MacDonald Daren Goody	5 years (12/17-11/22) <i>Status: In progress</i>	BGS, UK
6. NIH/GWH/PDS/ 17-21	Assessment of Impacts of Groundwater Salinity on Regional Groundwater Resources, Current and Future Situation in Mewat, Haryana – Possible Remedy and Resilience Building Measures	Gopal Krishan (PI), Surjeet Singh, C. P. Kumar (Retd.), <i>IIT-Roorkee:</i> M. L. Kansal, Brijesh Yadav <i>Sehgal Foundation:</i> Lalit Mohan Sharma	4 years (12/17-07/22) <i>Status: In progress</i>	NHP under PDS
7. NIH/GWH/PDS/ 17-21	Ganges Aquifer Management in the Context of Monsoon Runoff Conservation for Sustainable River Ecosystem Services - A Pilot Study	Surjeet Singh (PI), C. P. Kumar, Sudhir Kumar, Suman Gurjar, Gopal Krishan	4 years (12/17-07/22) <i>Status: In progress</i>	NHP under PDS
8. NIH/GWH/CEH M/18-22	Integrated Management of Water Resources for Quantity and Quality in Upper Yamuna Basin	Anupma Sharma (PI) S. K. Jain, A. Sarkar, M. K. Sharma, L. N.	4 years (04/18-01/24)	Special Project under “Centre of Excellence”

	up to Delhi	Thakural, Sumant Kumar, P.K. Mishra, V. Singh, N. Patidar, N. Kalyani <i>Partners</i> Haryana Irr. & WR Dept., UPGW Dept., UYRB, CWC	<i>Status: In progress</i>	(NHP)
9. NIH/GWH/DST/19-23	Enhancing Food and Water Security in Arid Region through Improved Understanding of Quantity, Quality and Management of Blue, Green and Grey Water	Anupma Sharma (PI), Gopal Krishan, Nitesh Patidar (<i>Lead: CAZRI Jodhpur, Partners: NIH Roorkee, IISWC Dehradun, CSWRI & CIAH, Bikaner, NIAM Jaipur</i>)	5 years (03/19 - 02/24) <i>Status: In progress</i>	DST
10. NIH/GWH/CCRB/20-23	Expansion of the Indo-German Competence Centre for Riverbank Filtration – CCRBF	Gopal Krishan (PI & Co-coordinator)	3 years (07/20 – 06/23) <i>Status: In progress</i>	Federal Min. of Education and Research, Germany
11. NIH/GWH/DST-SERB/21-24	Partitioning Evapotranspiration into Evaporation and Transpiration fluxes using Stable Isotopes of Oxygen and Hydrogen	Gopal Krishan (PI), MS Rao	3 years (04/21 – 03/24) <i>Status: In progress</i>	DST-SERB
12. NIH/GWH/APN/22	Capacity Development Program on Site Suitability Mapping for Managed Aquifer Recharge (MAR) under Varying Climatic Conditions using Remote Sensing and Machine Learning based Hydrological Modelling Tools	Nitesh Patidar (PI), S. Singh, G. Krishan <i>IIT Roorkee(lead):</i> Basant Yadav, Ashish Pandey, R D Singh, B. J. Deka <i>In-kind support:</i> KU, Japan: Yutaka Matsuno, PNU, South Korea: Sanghyun Jeong	10 months (01/22-10/22) <i>Status: New Study</i>	Asia-Pacific Network (APN)
Consultancy Projects				
1.	Groundwater Investigations of Rana Sugars Ltd. Buttar Seviyan Area of Amritsar District, Punjab	Surjeet Singh (PI)	6 months (01/22 – 06/22) <i>Status: In progress</i>	NIT, Jalandhar (Punjab)

HYDROLOGICAL INVESTIGATIONS DIVISION

Recommended Work Programme for the year 2022-23

S. N.	Project Title	Study Team	Duration	Status
<u>INTERNAL STUDIES:</u>				
1.	Assessment of dissolved radon concentration in groundwater of Uttarakhand	Hukam Singh (PI), M Someshwar Rao Soban Singh Rawat Vipin Agarwal	1 ¾ years (04/21-12/22)	Continuing Study
2.	Assessment of the Possible Impact of Climate Change on Evapotranspiration for Different Climatic Regions Of India	SD Khobragade (PI) Dr. Vishal Singh Sudhir Kumar	3 years (04/22-03/25)	New Study
3.	Ascertaining the efficacy of use of State of the art technologies for spring mapping and sustainability of springs through suitable interventions	Soban Singh Rawat, (PI) Sudhir Kumar, Santosh M. Pingale P K Mishra D. S. Bisht Rajesh Singh	3 years (04/22-03/25)	New Study
4.	Studies for selected springs of Tehri Garhwal region, Uttarakhand	MS Rao (PI) and Team		Chairman suggested that instead of Tehri Garhwal, a proposal on study of springs of North-East region may be formulated.
<u>SPONSORED PROJECTS:</u>				
1.	Dating very old ground waters of deeper aquifers in Ganga Plains, India	M. Someshwar Rao (PI) Sudhir Kumar	3 Years (06/16 - 12/22)	Continuing Study IAEA under CRP
2.	Chemical & Isotopic Characterization of Deep Aquifer Groundwater of Middle Ganga Basin	Sudhir Kumar (PI) M. Someshwar Rao Vipin Aggarwal	3 ½ year (01/18 – 06/22)	Continuing Study NHP (PDS)
3.	Integrated Study on groundwater dynamics in the coastal aquifers of West Bengal for sustainable groundwater management	M. S. Rao (PI), Sudhir Kumar A. R. Senthil Kumar V. S. Jeyakanthan	3 ½ years (01/18-06/22)	Continuing Study NHP (PDS)
4.	Development of a comprehensive plan for conservation and sustainable management of Bhimtal and Naukuchiatal lakes, Uttarakhand	Suhas Khobragade (PI) Sudhir Kumar	3 years (01/18-06/22)	Continuing Study NHP (PDS)

S. N.	Project Title	Study Team	Duration	Status
5.	Groundwater Rejuvenation As Climate change Resilience for marginalized and gender sensitive Ganges (GRACERS)	Sudhir Kumar (PI) SM Pingale	2 years (06/19 – 09/22)	Continuing Study (IIT Bombay, Mumbai)
6.	Web-GIS Based Spring Inventory for Vulnerability Assessment and Hydro-Geological Investigation of Selected Springs for Sustaining Local Water Demand in Ravi Catchment of Himachal Pradesh	S S Rawat (PI) Sudhir Kumar P G Jose Suman Gurjar D S Bisht	4 Years 17/08)– 0922/)	Continuing Study NHP (PDS)
7.	Web-enabled Inventory of Natural Water Springs of Tawi River Catchment of Jammu and Kashmir State of India for Vulnerability Analysis and Developing Adaptive Measures for Sustaining Tawi River	S S Rawat (PI) P G Jose Suman Gurjar D S Bisht	3 years (01/19-09/22)	Continuing Study (NMHS)
8.	Leachate transport modelling for Gazipur landfill site for suggesting ameliorative measures	Anjali (PI) Sudhir Kumar, J. V. Tyagi M. K. Sharma Partner: CGWB (Delhi unit)	3½ years (11/19 – 06/23)	Continuing Study NHP (PDS) Transferred from EHD
9.	Changing the fate of the Hindon river by evaluating the impact of agriculture on the water balance: Developing a template for a cleaner Ganga river	Sudhir Kumar, (Proj. Coordinator), M. K. Sharma, (PI) Suhas Khobragade Anjali Vishal Singh SM Pingale Nitesh Patidar Surjeet Singh	5 years (04/22-03/27)	DST

SURFACE WATER HYDROLOGY DIVISION

Recommended Work Programme for the year 2022-23

ONGOING STUDIES (SPONSORED)			
S. No. & Ref. Code	Title	Study Team	Duration
1. NIH/SWHD/1 9-23	Dam break studies of Kandaleru and Pulichintala dams in Andhra Pradesh (NHP)	P C Nayak Y.R.Satyaji Rao A.K. Lohani B. Venkatesh A. R. S. Senthil Kumar T. Thomas	3 year (Sept 2019 to April 2023)

ONGOING STUDIES (INTERNAL)			
S. No. & Ref. Code	Title	Study Team	Duration
1.NIH/SWHD/ 20- 22	Probabilistic dam break flood wave simulation and flood risk assessment for preparation of EAP for Mahi Bajaj Sagar dam in Rajasthan.	J.P. Patra Rakesh Kumar Pankaj Mani Sunil Gurrapu	2 years (July 2020 to August 2022)
2.NIH/SWHD/ 21-23	Uncertainty in rating curves and discharge estimation	Sanjay Kumar L. N. Thakural Sunil Gurrapu N.K. Bhatnagar J P Patra	2 Years (April 2021 to March 2023)

NEW STUDIES (INTERNAL)			
S. No. & Ref. Code	Title	Study Team	Duration
1.NIH/SWHD/ 22-22	Development of Cloud Data Based Integrated Framework to Forecast Flood for Efficient Operation of Reservoirs	A. K. Lohani, (PI) R. K. Jaiswal J. C. Patra P. C. Nayak Vishal Singh	Two Years April 2022 – March 2024
2.NIH/SWHD/ 22-23	Application of unified-extreme-value (UEV) distribution for flood frequency: selected rivers of U.S.A.	S.K. Singh	Six month (April 2022 to Sept. 2022)
3.NIH/SWHD/ 22-25	Application of unified-extreme-value (UEV) distribution for flood frequency: Comparison of results using GEV distribution	S.K. Singh	Six month (Oct. 2022 to March 2023)
4.NIH/SWHD/ 22-24	Flood Forecasting under Changing Climate Conditions - Role of Machine Learning and Conceptual/Physical based Model	P. C. Nayak A. K. Lohani J. P. Patra Sunil Gurrapu T. Thomas Om Prakash Jatin Malhotra	3 Year (July 2022 to June 2025)
5.NIH/SWHD/ 22-25	Hydrological Study to conserve the water resources of Bikaner, Rajasthan	L. N. Thakural M. K. Sharma R. K. Jaiswal	2 Year (July 2022 to June 2024)

		J. P. Patra P. K. Mishra Nitesh Patidaar N. K. Bhatnagar Jatin Malhotra Anil Kumar Chhangani	
6.NIH/SWHD/ 22-24	Review of design flood and dam break analysis of Khadakhai Dam in Odisha	J.P.Patra A. K. Lohani Pankaj Mani P. C. Nayak Sanjay Kumar	3 Year (April 2022 to March 2025)
7.NIH/SWHD/ 22-25	Climate change scenarios for Andhra Pradesh and its impact on streamflow and groundwater levels in Pennar River basin	Sunil Gurrapu Y R S Rao Nitesh Patidar R Venkat Raman	2 Year (April 2022 to March 2024)
8.NIH/SWHD/ 22-23	Investigation on occurrences of seasonal extremes across Northwest Himalaya in relation to global atmospheric thermal and circulation changes	Ashwini Ranade P.K. Mishra Sunil Gurrapu	3 years (April 2022 to March 2025)
9.NIH/SWHD/ 22-23	Investigating gap areas, current trends and future directions of research in Climate Change Impact on Hydrology and water Resources in India through Scientometrics	Archana Sarkar Jyoti Patil Rohit Sambare Charu Pandey	1.5 Year (May 2022 to Oct 2023)

WATER RESOURCES SYSTEMS DIVISION

Recommended Work Programme for the year 2022-2023

SN	Title	Study Team	Duration	Funding (Rs. Lakhs)
Ongoing Sponsored/ Internal Studies				
1.	Snow and glacier contribution and impact of climate change in Teesta river basin in Eastern Himalaya	Sanjay K. Jain P K Singh M. Arora A K Lohani Vishal Singh	3 years (11/19- 11/22)	NMHS- MoEF (143)
2.	Assessment of seasonal variations in Hydrology and Cryosphere of upper Ganga Basin	Vishal Singh Sanjay K. Jain A P Dimri (JNU)	3 years (06/19- 11/22)	NRDMS- DST (23.19)
3.	Development of Water Accounts for the different sub-basins of Brahmaputra and Barak River Basins in the state of Meghalaya Using Water Accounting Plus (WA+) Framework.	P K Singh P K Mishra P K Agarwal	2 years (08/20- 07/22)	NHP (14.50)
4.	Development of Water Accounts for the different sub-basins in the state of Nagaland Using Water Accounting Plus (WA+) Framework.	P K Mishra P K Singh Vishal Singh P K Agarwal	2 years (04/21- 03/23)	NHP (9.00)
5.	Long term hydrological assessment for the development of water security plan into three sub-basins namely Barak, Minor rivers draining into Bangladesh and Minor rivers draining into Myanmar sub-basins in the state of Mizoram	Vishal Singh M K Nema P K Singh Vanlalpekhluo Sailo (SDO from Mizoram); Lalruatkima (JE from Mizoram)	3 years (04/21- 03/24)	NHP (25.00)
6.	Impacts of glacier and climate change on runoff for selected basins of Himalayan region	Vishal Singh Sanjay K. Jain Manohar Arora	2 years (08/20- 07/22)	NIH (9.30)
7.	Monitoring and hydrological modeling of Henvat watershed in Lesser Himalaya	M K Nema Sanjay K Jain P K Mishra P K Agarwal	3 years (08/20- 07/23)	NIH (10.22)
8.	Seasonal Characterization of Gangotri Glacier melt runoff and simulation of streamflow variation under different climate scenarios	M. Arora P K Mishra Vishal Singh	3 years (04/21- 03/23)	NIH
New Internal/ Sponsored Studies				
1.	Spatio-temporal Water Availability under Changing Climate and Landuse Scenarios in Wainganga River Basin	M K Nema P K Mishra	2 years (04/22- 03/24)	NIH
2.	Monitoring and Assessment of Mountain Ecosystem and Services in North-West Himalaya (Phase-II): Monitoring and Modeling of Hydrological Processes in Glaciated and Non-Glaciated Watersheds of North-West Himalaya	M K Nema Sanjay K Jain P. K. Mishra Praveen Thakur (IIRS)	3 years (04/22- 03/25)	IIRS, Dehradun (30.91)

3.	Hydrological Assessment of Ungauged Basins (Aghanashini, Dasanakatte, Sita Nadi, Madisala Hole, Swarna Nadi and Gurupur River Basins) of the West Flowing Rivers in the Western Ghat Region of Karnataka	P K Singh; Vishal Singh Sanjay K Jain	3 years (04/22- 03/25)	WRD, Karnataka (54.0)
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RESEARCH MANAGEMENT AND OUTREACH DIVISION (RMOD)

Recommended Work Program for the year 2022-23

S N	Title of Project/Study	Funding	Study Team	Duration	Status
Internal Study					
1	Integrated assessment of water resources for sustainable use in Upper Dhasan basin in Bundelkhand region	NIH	Jyoti Patil (PI) T Thomas (Co-PI), P K Mishra Rohit Sambare	Sep 2020- Feb 2023	On-going
2	Establishing hydrologic regime and ecohydrological functions of Jhilmil Jheel wetland (Haridwar District, Uttarakhand)	NIH	Rohit Sambare (PI) V C Goyal (Co-PI), Suhas Khobragade, N R Allaka; Gajendra Singh-USAC, Dehradun; WI-SA, New Delhi; HESCO, Dehradun	Sep 2020- Aug 2023	On-going
3	Hydrology-based scenario planning for water productivity and optimization of income from farming practices in Mewat region, Haryana	NIH	A R Senthil Kumar (PI) Omkar Singh (Co-PI) Rajesh Agarwal, N R Allaka Scientist from KVK/Agri Univ.	Sep 2020- Aug 2022	On-going
4	Development of Water Security Plan for Healthcare Facilities: A Pilot Study for Swami Rama Himalayan University (SRHU-HIHT), Jolly Grant, Dehradun	NIH	Omkar Singh (PI) V.C. Goyal, Rajesh Singh (Co-PI), Jyoti Patil, Rohit Sambare, N.R. Allaka; Team from SRHU-HIHT, Dehradun	April 2022- Mar 2024	New Study
Sponsored Projects					
1	Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS)	DST (Gol)	V.C. Goyal (PI), Omkar Singh, Rajesh Singh, Jyoti P. Patil, Rohit Sambare, Project Team, HQ (IC- EcoWS) Partners: NIH, MNIT-Jaipur, IIT-Bombay, IRMA-Anand	Apr 2019- Mar 2024	On-going

Proposed Training/Webinar/Outreach Activities of RMOD (2022-23)

S.N.	Outreach Activity	Tentative Date & Month	Place	Target Participants	Team
1	Brainstorming session on 'Water Security in a Changing Environment- Focus on Indian Himalayan Region (IHR)', during 16th Uttarakhand Science and Technology Congress	June 2022	UCOST, Dehradun	Conference participants	V. C. Goyal, J P Patil, Amrendra Bhushan
2	5-days training on 'Life Cycle Approach for Rejuvenation of Ponds and Lakes using Nature-Based Solutions' sponsored by National Water Mission (4Nos)	April 2022 May 2022 June 2022 July 2022	Bhopal Belgaum Kakinada Roorkee	R&D Institutes/ University/ Govt. Organizations	Bhopal: T Thomas Belgavi: B Venkatesh Kakinada: YRS Rao Roorkee: J P Patil, Omkar Singh, Rohit Sambhare
3	Training on GEM	June 2022	NIH Roorkee	Admn and finance staff of NIH	A. R. Senthil kumar Omkar Singh
4	Webinar on ecohydrological functioning of wetlands	Jul 2022	NIH Roorkee	Students and researchers	Rohit Sambare V C Goyal
5	Stakeholders workshop for Upper Dhasan Basin water resources assessment	May 2022	Bhopal	CWC, CGWB, State depts (Irrigation, WRD, Agril etc)	J P Patil, T Thomas, P K Mishra, Rohit Sambhare
6	Workshop/Webinar on rejuvenation of ponds and treatment of domestic wastewater through constructed wetlands	Jul 2022	NIH Roorkee	R&D Institutes/Univer sity/Govt. Organizations	NIH: Omkar Singh, V.C. Goyal, Rajesh Singh, Digambar Singh UKCEH: Laurence Carvalho & Elliot Hurst
7	Five-day training program on "Hydrology of water bodies and their development under climatic uncertainty"	Jun/Jul 2022	NIH Roorkee	Engineers in Irrigation/PHE/S WC departments	A. R. Senthil kumar, Rohit Sambare, Santosh M Pingale, N R Allaka
8	E-course on Urban hydrology	June 2022	NIH, Roorkee NIUA, Delhi	Researchers, academicians, scholars	NIH: V C. Goyal, J. P. Patil NIUA: Victor Shinde
9	Awareness Programme for School Children	July-Sep 2022	3 schools in Roorkee/ nearby	School Children	Digambar Singh, Omkar Singh, A. R. Senthil kumar, Rajesh Agarwal, N R Allaka

Other Outreach Activities:

S.N.	Activity
1	<ul style="list-style-type: none"> • Preparation of Short Video on Pond Rejuvenation & CW-NTS of Ibrahimur Masahi • River Walk of Solani River • Short video on Hydrology for People @district level • Short video on vulnerability assessment under Hydrology for People series
2	<ul style="list-style-type: none"> • Coordination of 75 planned Activities at HQ & RCs under Azadi Ka Amrut Mahotsav @ India 75 • Organizing activities as per mandate of Division under Azadi Ka Amrut Mahotsav @ India 75 • Compendium of NIH activities on the activities under Azadi Ka Amrut Mahotsav @ India 75
3	<ul style="list-style-type: none"> • Any other Outreach activity on demand/assigned

HARD ROCK REGIONAL CENTRE, BELAGAVI

Recommended Work Program for the year 2022-23

S. N.	Project Title	Study Team	Duration	Status
<u>INTERNAL STUDIES:</u>				
1.	Monitoring and Evaluation of Ground Water Quality of Belagavi City, Karnataka, India	Varadarajan N (PI) Chandra Kumar S. Abhilash R	2 year (6/22 to 5/24)	New Study
<u>SPONSORED PROJECTS:</u>				
1.	Groundwater Model Development in Micro Basin of Hard Rock in Krishna And Godavari River Basins of Telangana	B Venkatesh (PI) M K Jose Sudhir Kumar Abhilash R & Officials form TSGWD	3 years (Sept 2019 –Aug 2022 Extended upto August 2023	Special Studies under NHP
2.	Impact of Sand Mining On Groundwater Regime in Parts of Manjira River Basin, Telangana State	M K Jose (PI) B Venkatesh Chandramohan T. Abhilash R and Officials form TSGWD	2 years Sept 2021 – Aug 2023	Special Studies under NHP
3	Comprehensive Assessment of Water Availability, Use and Issues for Goa State	B Venkatesh, Chandramohan T. Abhilash R and Officials of WRD Goa	2 years (01/22 to 12/23)	Special Studies under NHP

WESTERN HIMALAYAN REGIONAL CENTRE, JAMMU

Recommended Work program for the year 2022-23

S. No.	Title of Study	Team	Duration	Remarks
Internal Studies				
1.	Estimation of changes in snow cover and climate-cryosphere interaction in Upper Chenab river basin	P. G. Jose D. S. Bisht	02 Years 07 months (Aug. 2020 – Mar. 2023)	Ongoing, Extn. up to March 2023
2.	Mass balance of Phuche and Khardung glaciers, Ladakh with implications for downstream water availability under changing climate.	P. G. Jose D. S. Bisht D. Khurana	03 Years (July 2021- June 2024)	Ongoing
3.	Investigation of hydrodynamic approach of flood inundation mapping along with assessment of changes in river planforms using a cloud-based Google Earth Engine (GEE) computing platform in data-scarce Western Himalayan basin	R. V. Kale D. Khurana	03 Years (Sept. 2021-July 2024)	Ongoing
4.	Early signatures of 21 st Century on snow cover dynamics in Zanskar river basin, Ladakh	D. S. Bisht P. G. Jose	02 Years (July 2021 - June 2023)	Ongoing
5.	Comparative analysis of fine-scale satellite & reanalysis precipitation products in Upper Ganga Basin using Multi-Criterion Decision-Making	D. S. Bisht M. K. Goel	01 Year (June 2022 – May 2023)	New Study
Externally funded R & D Studies				
1.	Web-enabled inventory of natural water springs of Tawi river catchment of J&K State of India for vulnerability analysis and developing adaptive measures for sustaining Tawi river	S. S. Rawat P. G. Jose S. Gurjar D. S. galkate	03 years (April March 2019 to 2022)	Ongoing study funded by NMHS (2 Co-PIs at WHRC)
2.	Operational coastal flood management through short-to-medium range flood vulnerability mapping in the Brahmani-Baitarani River Basin integrating human and climate induced impacts	B. Sahoo, (PI, IIT-Kgp) R. V. Kale, (Co-PI)	03 years (July, 2020 – June, 2023)	Ongoing study funded under STARS by MHRD, Gol.
3.	Permafrost mapping and characterization of Western Himalayan Region	P. G. Jose A.P. Dimri (JNU) G. Jeelani (KU) V. Agnihotri (GBPNIHESD)	03 years (Aug 2019- Aug 2022)	Ongoing study funded under NMHS. PI vide letter dtd.10.2.2022

CENTRAL INDIA HYDROLOGY REGIONAL CENTRE, BHOPAL

Recommended Work Program for the year 2022-23

S N	Title of Project/Study	Study Team	Duration	Status & Comments/ suggestions	Funding
Internal Studies					
1.	An experimental assessment of low-cost Auger Hole Technique for accelerating groundwater recharge	NIH R.V. Galkate R.K. Jaiswal MP-WALMI Vivek Bhatt	2 years (Sept 2020 – August 2022)	Ongoing In-progress in collaboration with WALMI Bhopal	Internal
2.	Re-assessment of evapotranspiration (<i>ET_o</i>) estimation for irrigation planning in Madhya Pradesh	NIH R.V. Galkate R.K. Jaiswal A.K. Lohani Shashi Indwar MP-WRD, Bhopal Deepak Satpute Sayyam Jhanjari Sameer Soni	3 years (Nov 2021 – Oct 2024)	Ongoing In-progress in collaboration with BODHI, MPWRD Bhopal	Internal
3.	Water Availability Assessment for Project Formulation in Sub Basins of Ganga River in Madhya Pradesh	NIH R K Jaiswal, Ravi Galkate A K Lohani MP-WRD, Bhopal B Baghel	3 years (Nov 2021 – Oct 2024)	On-going	Internal
4.	Development of Reservoir Operation Plan under Climate Change scenarios for Kolar reservoir	NIH Shashi Indwar T. Thomas R. K. Jaiswal R.V. Galkate MP-WRD, Bhopal C.E, Hoshangaba, S.E Kolar E.E Kolar.	3 years (Oct 2021 – Sept 2024)	On-going	Internal
Sponsored Projects					
5.	Impacts of Upcoming Irrigation Projects and Climate Change on the Droughts and Desertification Scenario for Chambal Basin in Western Madhya Pradesh	NIH T. Thomas, B. Venkatesh R.V. Galkate Shashi Indwar R. K. Jaiswal P. C. Nayak Surjeet Singh MP-WRD, Bhopal Director Hydromet Mahesh Paliwal B. Baghel.	4 years (Dec 2017- July 2022)	Ongoing	PDS under NHP

6.	Integrated Assessment of the Impacts of Climate Change and Land-use Change on the Hydrology of the Narmada basin through Hydrological Modelling Approaches	NIH T. Thomas, B. Venkatesh P. C. Nayak Surjeet Singh Shashi Indwar MP-WRD, Bhopal Director Hydromet Mahesh Paliwal, B. Baghel.	5 years (Feb 2018 – Sep 2023)	Ongoing	Special PDS under NHP
7.	Hydrological Modeling for Evaluation of Return Flow and Irrigation Planning for Optimal Utilization of Water Resource in the Command of Sanjay Sagar Project in Madhya Pradesh	NIH R K Jaiswal Ravi Galkate T Thomas Shashi Indwar A K Lohani Sudheer Kumar Surjeet Singh MP-WRD, Bhopal Director, Hydromet, SE, GW circle, Database Admin, SE, EE, and AEs of Bah Project	4 years (Apr 2019 – Sept 2023)	Ongoing	PDS under NHP
8.	Development of Decision Tool for Efficient Utilization of Water Resource in Parbati Canal Irrigation Project of Rajasthan:	NIH R K Jaiswal, Ravi Galkate Shashi Indwar A K Lohani WRD Rajasthan Shailendra Kumar Sanjay Agrawal C B Garg	3 years (Apr 2019- March 2022) <i>(Granted Extension up to Sept 2022 by NPMU due to Corona reason)</i>	On-going	PDS under NHP
9.	Integrated reservoir operation studies for Mahanadi reservoir project complex in Chhattisgarh: SP-56/2021-22/NIH (CIHRC)	NIH R K Jaiswal, Ravi Galkate Shashi Indwar A. K. Lohani M. K. Goel, Vishal Singh Sumit Saini Dipti Rani WRD Chhattisgarh A. Verma, J. K. Das, V. K. Dubey A. Gupta, P. Awadhiya, IGKV Raipur S. Chandinah	2 years (Apr 2022-Mar 2024)	New Study	SP under NHP

DELTAIC REGIONAL CENTRE, KAKINADA

Recommended Work Programme for the year 2022–23

S.No.	Title of the Project	Team	Duration (Start Date and End Date)	Funding
I. Internal Project (ongoing)				
1.	Identification of Recharge and Discharge areas of Palar river basin in Tamilnadu	V.S. Jeyakanthan (PI) J.V.Tyagi Sudhir Kumar Y.R.Satyaji Rao R.Venkata Ramana	2 years 09/21 - 03/23	Internal Funding (NIH)
Internal Study (New project)				
2	Impact assessment of backwater through drains, creeks and river mouths on groundwater salinity in the Godavari Delta, Andhra Pradesh	Y.R.Satyaji Rao (PI) Sudhir Kumar V.S.Jeyakanthan R.Venkata Ramana	2 years 08/22 - 08/24	Internal Funding (NIH)
II. Sponsored Projects (Ongoing)				
3	Urban hydrological studies of critical pilot area using of hydrological instruments in the Greater Hyderabad Municipal Corporation (GHMC) area Hyderabad	R. Venkata Ramana (PI) Y.R.Satyaji Rao V.S.Jeyakanthan T.Vijay	3 Years 01/20-04/23	NHP (PDS) (LA: I & CAD, Govt. of Telangana) TEL-6_2017_2018
4.	High Performance Advanced Septic System for Villages and Roadside Restaurants	Y.R. Satyaji Rao (PI) T.Vijay	3 Years 04/18 – 12/22	IC – IMPACT Canada
III. Sponsored Project (New Project)				
5.	Quantification of SGD and its quality flux along the north coastal Andhra Pradesh	Y.R. Satyaji Rao (PI) Sudhir Kumar, S.M Pingale, M.K.Sharma R.Venkata Ramana	3 years (07/22 - 07/25)	Funded by NCESS, MoES

NIH-NORTH EASTERN REGIONAL CENTRE, GUWAHATI

Recommended Work Programme for the year 2022-23

Sl. No.	Title	Study Group	Duration (Month/Year)	Study Type	Remarks
Internal Projects (On-going)					
1.	Linear Hydrological routing using Satellite precipitation datasets for flood forecasting in parts of Brahmaputra Basin	*Gulshan Tirkey, S. K. Sharma P. Mani	#3 years (4/18 to 3/21)	Internal	*PI to be Dr. S.K. Sharma #Study extended till 3/23
2.	Rainfall Induced Flood Hazard Risk Vulnerability Assessment in East Jaintia Hills, Meghalaya	*G. Tirkey, S. K. Sharma A. K. Lohani	#2 years (9/20-8/22)	Internal	*PI to be Dr. S.K. Sharma #Study extended till 3/23
Sponsored Projects (On-going)					
3.	River basin planning studies in Teesta basin up to confluence with Rangit River in Sikkim	S. Barman M.K. Goel A.K. Lohani D.S. Rathore Deepti Raani W.R. Singh	3 years (3/19 to 2/22)	Sponsored under NHP	On-going
4.	Study on Behaviors of Flooding and Unexpected Drought like Situations in Garo Hills District of Meghalaya	S. K. Sharma R.P. Pandey Gulshan Tirkey S.Barman W.R. Singh	3 years (10/19 to 9/22)	Sponsored under NHP	On-going
5.	A Coupled Hydrodynamic and Bank Dynamic Modeling Approach for Forensic Analysis of Bankline Erosion Process Along Majuli Island- the Largest Inhabited River Island in the World	S. Barman, R.K. Bhattacharya M.K. Dutta, W.R. Singh	3 Years (4/21-3/24)	Sponsored under DST-SERB Power grant	On-going
Internal Projects (New)					
6.	Impact of Climate Change on Flood Inundation in Beki River Basin	S.K. Sharma, S. Barman, W.R. Singh, S.V. Vijaya Kumar	1 years (7/22-6/23)	Internal	New-Study
7.	Drought characterization and vulnerability assessment in Assam	W.R. Singh, S. Barman, S.K. Sharma, S.V. Vijaya Kumar, A.K. Lohani	2 years (7/22-6/24)	Internal	New-Study

CENTRE FOR FLOOD MANAGEMENT STUDIES, PATNA

Recommended Work Programme for the year 2022-2023

SI	Title	Study Team	Duration
Internal Studies			
1	Integrated Flood Management Plan for a stretch of Burhi Gandak River from Sikanderpur to Rosera	B Chakravorty(PI), Pankaj Mani and NG Pandey, Ex. Scientist	3 years (04/20-09/22)
2	Design flood estimation for small structures in the south Bihar area.	Pankaj Mani (PI), J. P. Patra B Chakravorty, I C Thakur, Director WALMI	2 years (04/21-11/22)
Sponsored Study (PDS/NHP)			
1.	Modeling and management of erosion and sedimentation processes in a reach of Gandak river using morphodynamic modeling	Pankaj Mani(PI) J. P. Patra B. Chakravorty & WRD Bihar	3 years (05/21-04/24)
New Study			
1.	Study of flood mitigation measures in Mahav nala using mathematical modelling study (New study)	Pankaj Mani (PI), J. P. Patra B Chakravorty with support from UP Irrigation Department and Forest Department (Maharajganj)	1 years (04/22-03/23)

The list of research papers published by the scientists and scientific staff of the Institute during Aug. 2021 – Mar.2022 & Apr. – June 2022 is given in **Appendix 76.4.2 [Page # 386 (Vol.-II)]**. The list of workshops/training courses/seminar/symposia organized during Aug.2021 – June 2022 is given in **Appendix 76.4.3 [Page # 402 (Vol.-II)]**. The progress of laboratory work done during Aug.2021 – June 2022 is given in **Appendix 76.4.4 [Page # 406 (Vol.-II)]**.

S.No.	Item	Published (Aug.21-Mar.22)	Published (Apr.-Jun 22)
1.	International Journal	49	17
2.	National Journal	14	00
3.	International Conference/ Seminar/ Symposium	80	01
4.	National Conference/ Seminar/ Symposium	03	00
5.	Books/Chapters	24	04
	Total	170	22

S.No.	Item	Aug.2021- Mar.2022	Apr.-June 2022
1.	Workshops/Training Courses organised	34	06

The TAC may please consider the progress and status of the Work Programme of the Divisions and RC/CFMS of NIH for the year 2022-23.

ITEM#76.7: Major projects and activities of national importance:

National Hydrology Project (NHP)

National Institute of Hydrology (NIH) is participating in NHP as one of the central agencies. There are a total of 47 implementing agencies (IAs) including eight central agencies (MoWR, RD&GR; CWC, CGWB, NIH, CPCB, Sol, NRSC and CWPRS), 37 state-level agencies and two river basin organizations (RBO) under NHP. Keeping in view the NHP objectives and initiatives, NIH is involved in the following activities of NHP:

- Demand driven research through Purpose Driven Studies (PDS)
- Training and Capacity building
- Centre of Excellence for Hydrological modeling
- Decision Support System (DSS)

Purpose Driven Studies (PDS)

One of the main focuses of NHP is Research and Development (R & D) in the form of Purpose Driven Studies (PDSs). Considering the peculiarities and large variation in the nature of problems associated with water resources planning and development, the issues involved in research related to particular region and specific project, the NHP is sponsoring research proposals of applied nature along with basic and action research. The research activities of such nature are implemented through R & D Section of NHP which is located at NIH. PDSs are related to specific issues of water management problems identified within the area of operation of implementing agencies and of public concern.

Training and Capacity Building

NIH has been assigned with the important task of planning and organizing the training programmes for capacity building of the IAs under NHP. The main objective of the training and capacity building activities is to create, enhance and develop capacity in IAs at desired level to plan, implement and operate water resources schemes. The NHP training section is involved in identifying the training needs and preparation of annual training programs in relevant areas in consultation with various implementing agencies.

Centre of Excellence for Hydrologic Modelling (CEHM)

Developing a “Centre of Excellence for Hydrologic Modelling” and giving leadership to the Country in hydrologic modelling services is one of the four major tasks assigned to NIH under the NHP. This centre is hosting knowledge repositories in hydrological processes understanding, advanced tools and techniques, advancement taking place from time-to time globally on hydrological research, tools and techniques to respond to the India’s hydrologic modelling services.

Decision Support System (DSS) Studies

Decision Support System (DSS) component is essential for up-gradation and maintenance of DSS software developed and implemented in the pilot basins of nine state agencies during HP-II project. New applications of DSS in other basins have been considered in association with states data centers and their planning and design departments. These activities would ensure the sustainability of DSS software in state implementing agencies and its utilization for planning various water resources activities.

National Mission for Sustaining the Himalayan Ecosystem (NMSHE)

The Department of Science & Technology (DST), GoI, has been the nodal ministry for coordinating National Mission for Sustaining Himalayan Ecosystem (NMSHE) under the National Action Plan on Climate Change (NAPCC). The broad objectives of NMSHE include - understanding of the complex processes affecting the Himalayan Ecosystem and evolve suitable management and policy measures for sustaining and safeguarding the Himalayan ecosystem, creating and building capacities in different domains, networking of knowledge institutions engaged in R&D of a coherent database on Himalayan ecosystem. DST entrusted NIH, Roorkee as nodal agency for assessing the impact of climate change on water, snow, ice, and glaciers in the Himalayas by funding a project entitled “*Integrated Hydrological Studies for Upper Ganga Basin up to Rishikesh*”. NIH along with other project partners completed the assignment by September 2021, under the following 11 sub-projects:

- a) Development of hydrological database in Upper Ganga basin
- b) Real-time snow cover information system for Upper Ganga basin
- c) Glacial Lakes & Glacial Lake Outburst Flood (GLOF) in Western Himalayan region
- d) Assessment of downstream impact of Gangotri glacier system at Dabrani and future runoff variations under climate change scenarios
- e) Observation and modeling of various hydrological processes in a small watershed in Upper Ganga basin
- f) Hydrological modeling in Alaknanda basin and assessment of climate change impact
- g) Hydrological modeling in Bhagirathi basin up to Tehri dam and assessment of climate change impact
- h) Study of river - aquifer interactions and groundwater potential in the upper Ganga basin up to Dabrani
- i) Understanding of hydrological processes in study basin by using isotopic techniques
- j) Environmental Assessment of Aquatic Ecosystem of Upper Ganga Basin
- k) Water Census and Hotspot analysis in selected villages in Upper Ganga basin

Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS)

The project ‘Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS)’ is funded by Department of Science & Technology (DST), Government of India. The National Institute of Hydrology (NIH) Roorkee is the leading institute for implementation of this project, in collaboration with the project partners from Indian Institute of Technology Bombay (IITB), Malaviya National Institute of Technology (MNIT), Jaipur and Institute of Rural Management Anand (IRMA), Ahmedabad.

The Centre is exploring the vast potential of NTS, especially constructed wetlands (CW) in Indian conditions by conducting research on improving the efficacy of CW in wastewater treatment. Different applications of wastewater treatment are being explored. Already, three stakeholders’ workshops have been conducted at different locations to create awareness and gauge perceptions of the potential users. The emerging concept of a Circular Economy in the field of wastewater treatment and reuse is also being explored at the Centre.

ITEM # 76.8: Reporting Items:

LIST OF ONGOING CONSULTANCY PROJECTS IN NIH (As on 25th July, 2022)

S.N.	PROJECT NO.	TITLE	CLIENT
1.	CS-19/2012-13/NIH(WRSD)	Cumulative Environment Impact Assessment studies for Satluj Basin in Himachal Pradesh	Indian Institute of Technology, Roorkee
2.	CS-21/2012-12/NIH/(SWHD)	Area Drainage Study for Plant and Ash Dyke for Gajmara Super Thermal Power Project (4 x 800 MW) Sponsored by NTPC Ltd, New Delhi.	NTPC, Ltd. NOIDA
3.	CS-30/2012-12/NIH/(SWHD)	Dam Break Analysis and Preparation of Emergency action Plan for Nagarjuna Sagar dam	Irrigation and CAD Dept., Govt. of Andhara Pradesh
4.	CS-31/2012-12/NIH (SWHD)	Dam Break Analysis for Indira Sagar Polavaram Project	Irrigation and CAD Dept., Govt. of Andhara Pradesh
5.	CS-39/2011-13/NIH(HID)	Integrated Hydrological Investigations of Sukhna Lake for its conservation and Management	Deptt of forest & wildlife, Chandigarh Administration, Chandigarh
6.	Cs-40/2012-13/NIH(HID)	Pre-Dredging and Post-Dredging Bathymetric Surveys of Ramgarh Taal, Gorakhpur (UP)	AHEC, IIT Roorkee
7.	CS-43/2012-2014/NIH(SWHD)	Estimation of Design basis flood and safe grade elevation for Mahi-Banswara Power Project	NPCILMumbai
8.	CS-60/2013-2015/NIH (SWHD)	Hydraulic Modelling for Brahmaputra Riverfront Development ProjectFor Guwahati	Guwahati Metropolitan Dev Authority
9.	CS69-2014-2016/NIH(SWHD)	Area Drainage Study including hydrological designof site area drainage for Chutka lake	NPCIL Mumbai
10.	CS-70/2014-15/NIH(SWHD)	EFR of Shogtong Karchham HE project in HP	HPPCL, Kinnaur
11.	CS-74/ 2015-16/NIH(SWHD)	Water loss study for Pushkar Sarovar, Ajmer	Executive Engineer, NLCP, Pushkar, ADA, Ajmer
12.	CS-75/2015-15/NIH(HID)	Estimation of Canal Seepage & Ground Water Recharge using Isotopic Techniques in the Chajlet Block Moradabad Distt	Ground Water Department, Lucknow
13.	CS-77/2015-15/NIH(SWHD)	Environment flow requirement of River Parbati & Tons Nallah by using Hydraulic Rating Method & suitable recommendations thereof for Nakthan HEP	HPPCL, Kinnaur
14.	CS-81/2014-16/NIH (SWHD)	Preparation of emergency action plan for NSRSSP and inundation map	CE, NSRSSP, Hyderabad

		associated with dam break analysis in AP	
15.	CS-87/2015-16/NIH(HID)	Hydro geological study for Harduaganj, 1x660 MW HTPS Distt Aligarh, UP	UPRVUNL Ltd
16.	CS-94/2016-17/NIH(Jammu)	Establishment of silt conservation post in the Bagalihar HEP catchment	Deptt of soil & Water conservation, Narwal, Jammu
17.	CS/99/2016-16/NIH(Kakinada)	Hydrological study/ Water Availability Study of Brahmani River at 2x600 MW power station Odissa	LANCO Gurgaon
18.	CS-113/2017-18/NIH(WRSD)	Land use planning of Farakka Barrage Project area: Land use mapping	Farrakka barrage project MOWR
19.	CS-114/2017-18/NIH(WRSD)	CEIA study for less than 10 MW HEP (Part II) for Satluj basin	AHEC, IIT Roorkee
20.	CS119/2017-18/Bhopal	Preparation of Emergency Action Plan for six projects of MP Water Resources Deptt	Bodhi, WRD Bhopal
21.	CS-120/2017-18/RC-BE	Dam break Analysis for dams in Kali Basin and Flood Review of Kali and Sharavathi Basins	KPCL Bangalore
22.	CS-121/2017-18/RC-BE	Estimation of Yield for Bembla Project in Maharashtra	EE, Lower Penganga Division, Yevatmal, Maharashtra
23.	CS-122/2017-18/RC-BH	Preperation of Emergency Action Plan for Three projects of M. P. WRD	BODHI-WRD Bhopal
24.	CS-129/2018-18/RC-BH	Preparation of Working Table for Multiple Reservoirs of Bina Complex	BODHI, Bhopal
25.	CS-138/2017-21/HID	Hydro Geological Study for dewatering of Jhamkotra mines, Udaipur	Rajsthan State Mines and Mineral ltd Udaipur
26.	CS-142/2017-18/HID	Water Quality and isotopic analysis of groundwater along paleo-channels of Saraswati river in Haryana State	WAPCOS Ltd
27.	CS-143/2016-19/SWH	Studies for estimation of design basis flood and safe grade elevation for the inland nuclear power plant site at Kaiga in Uttara Kannada district of Karnataka	NPCIL Mumbai
28.	CS-146/2018-19/SWH	Preparation of strategic land and water management plan for rejuvenation of Rispana River Basin	Irrigation Department Uttarakhand
29.	CS-154/2018-19/SWH	Engineering Services for Carrying out area drainage studies for proposed 4x700 MW Mahi Banswara Rajsthan Atomivc Power project	NPCIL Ltd
30.	CS-158/2018-19/RC-BE	Preparation of EAP and study of tail channel design flood carrying capacity of Amazon lake Nagpur	SE, CADA, Nagpur
31.	CS-159/2018-19/SWH	Concurrent Evaluation of Flood Management Scheme of Ganga (Distt Haridwar) (Scheme code UK-18)	Uttarakhand Irrigation Deptt Haridwar
32.	CS-161/2018-19/SWH	Concurrent Evaluation of Flood Management Scheme of Ganga	Uttarakhand Irrigation Deptt Haridwar

		(Bhogpur to Baliwala) (Scheme code UK-16)	
33.	CS-165/2018-19/SWH	Design of flood protection walls for proposed Kaiga 5&6 Project at Kaiga Site in Karnataka	NPCIL Ltd Mumbai
34.	CS-166/2018-22/HID	Pollution Source identification using stable isotopic studies in and around chemical division, Nagda, MP	NEERI Hyderabad
35.	CS-173/2019-19/SWH	Environmental Flow and power potential Studies for Bhilangana-HEP-III	Bhilangana Hydropower Ltd. Noida
36.	CS-176/2019-19/GWH	Water availability study based on Hydrological investigation & rainfall runoff modelling of Upper Hindon Basin	Up Irrigation Saharanpur
37.	CS-178/2019-20/GWH	Assessment of Saline & Fresh water zones in Faridkot, Fazika and Muktsar districts of Malwa Region of Punjab	Department of Agriculture, Punjab
38.	CS-179/2019-19/RC(BH)	Planning of Rainwater Harvesting work at IIT Indore	CPWD, IIT Indore
39.	CS-182/2019-20/WRS	Flood routing in the reach between Rajghat and Matatila dam in Betwa River basin for the proposed Dhurwara dam project	IWRD Govt of UP
40.	CS-184/2019-20/RC-BE	Preparation of Report on Hydrology of Kalasanala and Bhanduranala Diversion Scheme for Drinking Water Supply in KKhanpur Taluka, Belgaum, Karnataka	EE, KNNL, Kalasa Project Div , Khanpur
41.	CS-187/2020-21/RC(Belagavi)	Hydro-geological studies in and around "Redi Iron Ore Mine" (Patni Mine) of M/S Minerals & Metals located at Village Redi, Taluka Vengurla, District Sindhudrug, Maharashtra	M/S Minerals & Metals (Patni Mines), Maharashtra
42.	CS-188/2020-21/RC(Belagavi)	Hydro-geological studies in and around "Redi Iron Ore Mine" (Block I) of M/S Gogte Minerals, located at Village Redi, Taluka Vengurla, District Sindhudrug, Maharashtra	M/S Gogte Minerals, 146, Tilakwadi, Belgaum-590006
43.	CS-191/2020-22/EHD	Estimation of economic losses in real terms per hectare basis due to forest fire in Uttarakhand and Madhya Pradesh	Indian Council of Forestry Research and Education Dehradun
44.	CS-193/2020-20/RC(BH)	Estimation of Revised Capacity and Sedimentation Using Bathymetric Survey of Tigra Dam, Gwalior (MP)	Water Resources Department, Harsi Jal Sansthan Sambhag, Dabra (M.P.)
45.	CS-194/2020-20/RC(BH)	Detection of the Leakage Sources and suggested Measures for Repairs, Renovation & Strengthening for Tigra Dam, Gwalior (MP)	Water Resources Department, Harsi Jal Sansthan Sambhag, Dabra (M.P.)
46.	CS-195/2020-21/WRS	Study of various Possible Scenarios for Understanding the Long-term effect of en-route canal irrigation for Mahandi-Godavari Link	National Water Development Agency, New Delhi

47.	CS-196/2020-21/HID	Hydrological Study of Tanda Thermal Power Plant Stage –II (2x660MW)	NTPC Ltd
48.	CS-197/2020-21/HID	Hydrological Study at NTPC Kudgi	NTPC Ltd
49.	CS-200/2020-20/RC(Belagavi)	Preparation of Emergency Action Plan (EAP) and flood inundation map for Rakasakoppa Dam	KUWS &D Borad, Belagavi
50.	CS-201/2020-20/RC (Belagavi)	Preparation of Flood Management Plan (FMP) and Channel Depth calculation for Unkal Nala, Huballi	Managing Director, HDSCL, Hubballi
51.	CS-202/2020-22/HID	Review of Hydrogeology to assess Impact of NTPC Mouda on surface water and ground regime (especially around ash dyke (St-I & II) and propose specific measures	NTPC Limited, SSC WR1, Surat
52.	CS-204/2020-20/RC(Patna)	Risk Assessment Study for Earthen Reservoir at Nachna & Township for Rajasthan Refinery cum Petrochemical of HPCL Rajasthan Refinery Limited (HRRL)	HPCL Rajasthan Refinery Limited (HRRL)
53.	CS-206/2020-21/GWH	Hydro-geological investigation of the site nearby to the M/S Marshall Cycle and M/S Kathuria Brothers Ghaziabad	Dr. Brijesh Yadav, Deptt. of Hydrology, IIT Roorkee, Roorkee - 247667
54.	CS-207/2020-21/GWH	Geo Environmental Study in and around areas of Oil Marketing Companies located in Manglia, Indore	BPCL Mangila Terminal, Indore
55.	CS-212/2020-21/RC-BL	Hydrological Review of Rakasakoppa Dam	Karnataka Urban water supply and Drainage Board, Belagavi
56.	CS-217/2021-22/SWHD	Hydrological Studies in view of Updation of Hydrological aspects of kishan DPR	Kishan corporation Ltd. Kishan Bhawan, tom colony Dakpathar, vikashnagar Dehradun-248125
57.	CS-218/2021-22/SWHD	Dam break Flood Analysis and Pregaration of Emergency Action plan for Ukai Dam, kadama Dam, Dhanoi Dam, Panam Dam, Shetrunji Dam, Hiran dam, and Machhundri Dam	Water resources Department, Govt. of Gujarat, Gandhinagar
58.	CS-219/2021-22/SWHD	Hydro- geological study in Meja, Prayagraj, U.P	Meja Urja Nigam Pvt. Ltd.
59.	CS-221/2021-22/HID	Feasibility study for implementation of urban run off tretment and rin water harvesting scheme in Krishna Nagar, Roorkee	Nagar Nigam, Roorkee
60.	CS-222/2021-22/HID	Sustainable Ground water management plan for Hapur, Gautam Budh Nagar, Bulandshahar & Ghaziabad	Udyog Bandhu (INVEST UP), Lucknow
61.	CS-223/2021-22/HID	Seepage Problem in the basement of Allahabad High Court, U.P.	Executive Engineer, Constructon Division - 1, PWD, Prayagraj

62.	CS-224/2021-22/EHD	Estimation of sediment land & GHS emission from Redervoir of Chamba I Power Station, NHPC	Innovate water solution Pvt. Ltd, Roorkee
63.	CS-226/2021-22/GWHD	Ground water investigation of Rana Sugar Ltd Butter Seviyan area of Amritsar Distt., Punjab	Dr. B. R. Ambedkar, National institute of technology, Jalandhar, Punjab
64.	CS-227/2021-22/HID	Review of Hydrogeology to assess Impact of NTPC Mouda on surface water and ground regime (especially around ash dyke & prepare specific mitigation measures NTPC Khargaone	
65.	CS-228/2021-22/HID	Biennial review of hydrogeology to assess the impact of NTPC Gadarwara STPP at surface and ground water	
66.	Cs-229/2021-22/HID	Study for finding out the reason of water logging in the adjoining area of Ash Dyke at IGSTPP, Jhajjar	Aravali Power Company Pvt. Ltd. Jhajjar, Haryana
67.	CS-230/2022-23/RMOD	Impact Assesment of rejuvenated ponds in Saharanpur Distt. U.P.	
68.	CS-231/2022-23/SWHD	Engineering Services for carrying out extreme value analysis & statistical analysis of latest metrological data for Mahi Banswara Rajasthan Atomic Power Project (MBRAPP)	
69.	CS-232/2022-23/EHD	Performance evaluation of Nano Catalistical Instant Water Convertor (NCIWC) equipment for Water waste water treatment	
70.	CS-235/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Singrauli	
71.	CS-236/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Jhanor-Gandhar	
72.	CS-237/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Rihand	
73.	CS-238/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Unchahar	
74.	CS-239/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Anta Rajasthan	
75.	CS-240/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Sipat	
76.	CS-241/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Korba	
77.	CS-242/2022-	Study of Rainwater Harvesting	

	23/HID	Structure/Facilities/Systems at NTPC Lara	
78.	CS-243/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Ramagundam	
79.	CS-244/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Mandsaur	
80.	CS-245/2022-23/HID	Study of Rainwater Harvesting Structure/Facilities/Systems at NTPC Farrakka	

ITEM # 76.9: Any other item with permission of the Chair