

## **Minutes of 77<sup>th</sup> meeting of Technical Advisory Committee (TAC) of National Institute of Hydrology, Roorkee held on 19<sup>th</sup> February 2024 (Online mode)**

The 77<sup>th</sup> meeting of the Technical Advisory Committee (TAC) of the National Institute of Hydrology, Roorkee was held in online mode on 19<sup>th</sup> February, 2024. The meeting was chaired by Shri Kushvinder Vohra, Chairman, CWC. The list of the participants is given in Annexure-I.

Dr. M. K. Goel, Director, NIH first welcomed the Chairman (TAC), members and invitees to the meeting. He briefed about the role of the Working Group and Regional Coordination Committees constituted to review the work programme at Headquarters and Regional Centers of NIH. After a round of brief introduction of members, invitees and all Heads of Divisions and RCs of NIH, the Director invited the Chairman, TAC for his opening remarks.

At the outset, the Chairman welcomed all the participants to the meeting. The Chairman, in his opening remarks, stressed on the need to carry out relevant technical work/studies ensuring to avoid any duplication of work which is already done/under-progress by other Government departments. The Chairman stressed that climate change and its impact on water resources is already being realized in the country in the form of hydrological extremes. Accordingly, there is need to make short, medium and long-term plans to meet the challenges in management of our water resources under various uncertainties/extremes. The Chairman appreciated about the achievement of patent by NIH related to the Fluoride removal media for drinking water and suggested to explore its outreach for maximum utilization by the society. He also suggested to work together with line-organizations like CWC, CGWB, etc. in various areas of water resources. Director, NIH suggested that there should be active collaboration between CWC & NIH for carrying out specific studies which are of interest to both the organizations. The Chairman also desired to identify needs for capacity building of scientists in various areas of hydrology & water resources and to impart and conduct training activities.

After opening remarks by the Chairman, the Director, NIH gave a brief overview of the Institute's activities. Thereafter, he requested all Divisional Heads to give an overview of activities of their respective Divisions at HQ. Accordingly, all the Divisional Heads at HQs Roorkee [Surface water hydrology division, Environmental hydrology division, Hydrological Investigations division, Water resources systems division, Groundwater hydrology division, and Centre of cryosphere and climate change studies (C4S)] briefly apprised the TAC about some important technical activities of respective scientific divisions through brief presentations.

The Chairman, along with some other members, appreciated the NIH for carrying out R&D studies in various important areas of hydrology & water resources and advised that the outcome of the completed studies may be highlighted. He further stressed that while planning new studies, the relevant stakeholders/concerned organizations (CWC, CGWB, etc.) may be contacted to get relevant information so as to avoid any duplication.

After brief presentations of the respective Divisional Heads, the Director invited Shri Omkar Singh, Scientist "G" & Head, Technical Cell/Member-Secretary to take up the agenda items in the meeting.

### **ITEM NO. 77.2: Confirmation of the minutes of 76<sup>th</sup> meeting of TAC**

The Member-Secretary informed that minutes of the 76<sup>th</sup> meeting of TAC, held on Aug.29, 2022 were circulated to all the members and invitees vide email dated Oct. 17, 2022. Since no comments were received from the members, the minutes were confirmed by the TAC.

### **ITEM NO. 77.3: Actions taken on decisions/recommendations in the previous meeting**

The Member-Secretary presented the actions taken on the comments and suggestions of the members during the previous meeting. On the issue of pending case of the creation/cadre review of a post of documentation officer to look after the requisite task of compilation of hydrological research in India on identified topics, the Chairman advised to hire a consultant to perform the requisite work. Regarding the completed study on water quality assessment of South-west Punjab emphasizing carcinogenic contaminants and their possible remedial measures, it was informed that comments by the experts have been incorporated in the report. The Chairman advised that the study may be sent to NMCG for expert review.

For effective collaboration of NIH with CWC on specific areas of research (viz. climate change studies etc.), the Chairman suggested to send a note to CWC for taking up the matter for nominating a nodal officer from CWC. Regarding the study entitled “Long term hydrological assessment for the development of water security plan for three sub-basins namely Barak, Minor rivers draining into Bangladesh and Minor rivers draining into Myanmar sub-basins in the state of Mizoram” it was informed that the confidentiality of the study/report will be duly mentioned at the cover page while submitting to NPMU.

### **ITEM NO. 77.4: Status of the work programme for the year 2022-23**

The Member-Secretary briefly mentioned about the studies carried out by the Institute during the year 2022-2023. He reported that 15 sponsored projects and 12 internally funded R&D studies were completed during the year. The following three studies were planned for detailed presentation during TAC Meeting:

- A brief presentation of NH Model developed under NHP jointly by IIT, Kharagpur and NIH (Prof. R. Singh, IIT-KGP & Dr. A.K. Lohani, Sc. G).
- Impacts of glacier and climate change on runoff for selected basins of Himalayan region (PI: Dr. Vishal Singh, Sc. D)
- Integrated GEE-MODFLOW based Groundwater Recharge Assessment System for Hindon River System (Dr. Nitesh Patidar, Sc. C).

The Chairman desired to discuss the findings of the completed studies in detail in the next TAC meet. Dr. Suhas P. Wani advised to report important outcome/summary of completed studies along with utility for common public/other stakeholders. Prof. K.V. Jayakumar advised to carry both basic and applied research in relevant areas including urban flood. It was informed that brief description of all studies (ongoing/completed) during the year have been briefly presented in Appendices.

The Member-Secretary also presented the technical achievements of the Institute during 2022-23. The Chairman appreciated the achievements made by NIH during the year. The Chairman desired a common platform for NIH and CWC for regular interaction. The Chairman expressed his desire that a 1 – 2 days meeting detailing the outcome of various studies may be organized in near future (in April – May, 2024) at NIH, Roorkee. The Director, NIH expressed that next meet of TAC can be held for 1-2 days at NIH Roorkee (after the organization of Working Group and RCC meetings) so that detailed presentations of some important NIH studies can be made.

TAC noted the progress of the studies/projects of the Institute during the year 2022-2023.

Additional comments/suggestion were also received from Prof. Rohit Goyal (MNIT, Jaipur) through e-mail. He expressed the need for better collaboration amongst technical Institutes and NIH Regional Centers to avoid duplication as well as to undertake more focused and relevant research. In this connection, he proposed collaboration through opening of Regional Academic Centre for Hydrological Research (RACHR or whatever name is proposed) in different zones.

#### **ITEM NO. 77.5: Proceedings of the Working Group and Regional Coordination Committee (RCC) meetings**

The Member-Secretary briefly mentioned about the 53<sup>rd</sup> meeting of the Working Group of NIH which was held during 16-17 March, 2023 and the RCC meetings held at the different Regional Centers. During these meetings, the Working Group/RCC members reviewed the progress of studies for the year 2022-2023 and recommended the work program for 2023-24. The TAC noted the proceedings of 53<sup>rd</sup> WG and RCC meetings.

#### **ITEM NO. 77.6: Work Program for the year 2023-24**

The Member-Secretary briefly mentioned about the proposed work programme of the Institute for the year 2023-24 which was discussed during the 53<sup>rd</sup> Working Group meeting and various RCC meetings of NIH. The proposed work programme of the Institute for F.Y. 2023-24, as recommended by the Working Group and the respective RCCs, was also placed before the TAC. TAC approved the work programme of the Institute for the year 2023-24 (Annexure-II).

#### **ITEM NO. 77.7: Major projects and activities of national importance**

The Member-Secretary informed that following two major R&D projects are currently ongoing at NIH:

1. National Hydrology Project (NHP)- funded by The World Bank & GoI
2. Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS)- funded by DST (GoI)

### **ITEM NO. 77.8: Reporting Items**

The Member Secretary informed that the NIH has completed 11 consultancy projects and 36 consultancy projects were ongoing during the year 2022-23, as sponsored by various agencies.

### **ITEM NO. 77.9: Additional items with the permission of the Chair**

Director, NIH informed that a non-contact discharge estimation methodology has been developed recently (at Ph.D. work at DoH, IIT-Roorkee) and subsequent modified and the same needs to be tested at some gauging stations before its recommendation for wider applicability. Further, CWPRS has developed another non-contact methodology based on infrared sensor and photography. It is desirable to test and verify the results of various techniques before their wider usage. As CWC has a vast network of discharge gauging stations in the whole country, he suggested to identify 3- 4 gauging sites of CWC in different parts of the country (probably with facilities of ADCP, AWLR, AWVR etc.) for testing of the methodologies and comparison of results. The Chairman agreed and advised to consult with Shri D. P. Mathuria, CE (CWC) in this matter. Prof. M. K. Jain (DoH, IIT-Roorkee) informed that DoH, IIT-Roorkee is having a MoU with CWC and they are jointly monitoring/testing the advanced methodologies in the Bhagirathi river basin (Uttarakhand).

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

**LIST OF PARTICIPANTS IN THE 77<sup>TH</sup> MEETING OF TAC OF NIH**

1.	Sh. Kushvinder Vohra, Chairman, CWC	In-chair
2.	Sh. S.K. Sibal, Member (D&R), CWC	Member
3.	Shri Manoj Tiwari, CE, HSO, CWC	Member
4.	Dr. M.K. Goel, Director, NIH	Member
5.	Dr. Alok Sikka, IWMI, New Delhi	Member
6.	Prof. K. V. Jayakumar, IIT, Dharwad	Member
7.	Prof. M.K Jain, DoH, IIT, Roorkee	Member
8.	Dr. Suhas Wani, IRRI, SARC, Varanasi	Member
9.	Prof. Rohit Goyal, CE Dept., MNIT, Jaipur	Member
10.	Er. Omkar Singh, Sc. G & Head, Technical Cell, NIH	Member-Secretary

**INVITEES**

1. Dr. A.K. Lohani, Sc. G & Head, SWH Div., NIH, Roorkee
2. Dr. R. P. Pandey, Sc. G & Head, EH Div., NIH, Roorkee
3. Dr. Suhas Khobragade, Sc. G & Head, HI Div. NIH, Roorkee
4. Dr. A.R. Senthil Kumar, Sc. G & Head, WRS Div., NIH, Roorkee
5. Dr. Anupma Sharma, Sc. G & Head, GWH Division, NIH, Roorkee
6. Dr. Surjeet Singh, Sc. G & Head, C4S, NIH, Roorkee
7. Dr. Y. R. .S. Rao, Sc. G & Head, RC-Kakinada
8. Dr. B. Venkatesh, Sc. G & Head, RC- Belagavi
9. Dr. Pankaj Mani, Sc. G & Head, CFMS-Patna
10. Dr. T. R. Nayak, Sc. G, RC, Bhopal
11. Dr. Ravi Galkate, Sc. F & Head, RC-Bhopal
12. Dr. R. K. Jaiswal, Sc. F, NIH, RC-Bhopal
13. Dr. Sanjay Kumar Sharma, Sc. D, RC, Guwahati
14. Dr. P.G. Jose, Sc. E & Head, RC, Jammu.
15. Dr. M. S. Rao, Sc. G, NIH, Roorkee
16. Dr. P. C. Nayak, Sc. F, NIH, Roorkee
17. Dr. Sanjay Kumar, Sc. F, NIH, Roorkee
18. Dr. M. K. Sharma, Sc. F, NIH, Roorkee
19. Dr. Soban Singh Rawat, Sc. F, NIH, Roorkee
20. Dr. T. Thomas, Sc. E, NIH, RC-Bhopal
21. Dr. M.K. Nema, Sc. E, NIH, Roorkee
22. Dr. R.V. Kale, Sc. E, NIH, Roorkee
23. Dr. Pradeep Kumar, Sc. E, NIH, Roorkee
24. Shri J. P. Patra, Sc. E, NIH, Roorkee
25. Dr. L. N. Thakural, Sc. E, NIH, Roorkee
26. Dr. P. K. Singh, Sc. E, NIH, Roorkee
27. Dr. Sumant Kumar, Sc. E, NIH, Roorkee
28. Dr. Rajesh Singh, Sc. E, NIH, Roorkee
29. Dr. Gopal Krishan, Sc. E, NIH, Roorkee
30. Dr. Ashwini A. Ranade, Sc. D, NIH, Roorkee

31. Dr. P. K. Mishra, Sc. D, NIH, Roorkee
32. Dr. Vinay K. Tyagi, Sc. D, NIH, Roorkee
33. Dr. S.M. Pingale, Sc. D, NIH, Roorkee
34. Dr. Sunil Gurrapu, Sc. D, NIH, Roorkee
35. Dr. Vishal Singh, Sc. D, NIH, Roorkee
36. Ms. Shashi P. Induwar, Sc. D, RC, Bhopal
37. Ms. Swapnali Barman, Sc. D, RC Guwahati
38. Dr. Tripti M., Sc. D, NIH, Roorkee
39. Dr. Nitesh Patidar, Sc. C, NIH, Roorkee

**ENVIRONMENTAL HYDROLOGY DIVISION****Approved Work Programme for the Year 2023-24**

<b>S. No.</b>	<b>Study Title</b>	<b>Study Team</b>	<b>Duration/Status</b>
<b>Sponsored R&amp;D Projects (Ongoing)</b>			
1.	Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS)	Omkar Singh (PI), Rajesh Singh, Jyoti P Patil, VK Tyagi, Kalzang Chhoden, Rajesh Agarwal <b>Partners:</b> NIH, MNIT-Jaipur, IIT-Bombay, IRMA-Anand	5 Years (04/19 - 03/24), Sought Extn for 6 months <b>Project Cost:</b> 5.1 Crore <b>Sponsored by:</b> DST <b>Status:</b> In-progress
2.	Water Efficient Irrigation by Using SCADA System For Medium Irrigation Project (MIP) Shahnehar	RP Pandey (PI), JP Patra, Rajesh Singh, Shakti Suryavanshi, SK Kumre, NK Bhatnagar	3 Years (12/17-03/24) <b>Project Cost:</b> 75 Lakh <b>Sponsored by:</b> NHP <b>Status:</b> In-progress
3.	Anaerobic Co-digestion of Thermochemically Pretreated Organic Fraction of Municipal Solid Waste and Sewage Sludge: Effect on Process Performance and Microbial Community Development	Vinay Kumar Tyagi (PI)	5 Years (2018-2023) <b>Project Cost:</b> 106 Lakhs <b>Sponsored by:</b> DBT <b>Status:</b> In-progress
<b>Collaborative R&amp;D Projects (Ongoing)</b>			
4.	Isotopic and geochemical approach to study vulnerable confined and unconfined drinking water aquifers in Varanasi and surrounding area, India	Rajesh Singh (PI), R.P. Pandey BHU, Varanasi (Lead) Other Collaborators: BARC, Mumbai, ICER, Hungary	3 Years (07/21-06/24) <b>Sponsored by:</b> BHU <b>Status:</b> In-progress
5.	Comprehensive characterization of variably processed sewage sludge in Ganga basin to classify its suitability for safe disposal	VK Tyagi, (Co-PI) AA Kazmi (PI, IITR)	02 Years (01/22-12/23) <b>Sponsored by:</b> Central Pollution Control Board (CPCB)-NMCG <b>Status:</b> In-progress
6.	SARASWATI 2.0 - Identifying best available technologies for decentralized wastewater treatment and resources recovery for India	VK Tyagi, (Co-PI) AA Kazmi (PI, IITR)	4 Years (03/20-02/24) <b>Sponsored by:</b> Department of Science & Technology (DST) <b>Status:</b> In-progress
<b>Internal Study (Ongoing)</b>			
7.	Characterisation of Groundwater Dynamics in Krishna-Godavari Delta interims using groundwater levels, Hydrochemistry, Isotopes and Emerging Contaminants	MK Sharma (PI), Suhas Khobragade, Rajesh Singh	2 Years (04/22-03/24) <b>Status:</b> In-progress
8.	Understanding arsenic mobilization in groundwater of Haridwar and formulating remediation measures	Rajesh Singh (PI), RP Pandey, Sumant Kumar, Pradeep Kumar, MK Sharma, VK Tyagi, Kalzang Chhoden	3 Years (07/21-06/24) <b>Status:</b> In-progress
9.	Simulation of Non-Point Source Pollution Processes in Song River	Pradeep Kumar (PI), MK Sharma, Rajesh Singh	4 Years (11/19-10/23) <b>Status:</b> In-progress
10.	Hydrological Studies for the	Kalzang Chhoden (PI)	3 Years (12/22-11/25)

	Conservation of Rewalsar Lake	Rajesh Singh, RP Pandey, P Kumar, VK Tyagi, Omkar Singh, Shuhas Khobragade DS Malik, GKU, Haridwar	<b>Status:</b> In-Progress
11.	Comprehensive evaluation of disinfection units of STPs in Ganga basin: Occurrence and control the formation of emerging oxidation precursors	VK Tyagi (PI), Rajesh Singh, MK Sharma, P Kumar, JP Patra, Kalzang Chhoden, RP Pandey	3 Years (04/23 - 03/26) <b>Status:</b> In-Progress
<b>Consultancy Projects (Completed)</b>			
12.	Estimation of Sediment Load and GHG Emission from Reservoir of Chamera-1 Power Station, NHPC	JV Tyagi, RP Pandey, Rajesh Singh (PI), MK Sharma	15 Months (12/21-03/23) <b>Funded by:</b> Innovante Water Solution Pvt. Ltd. <b>Cost:</b> Rs. 3.245 Lakh
13.	Performance evaluation of Nano Catalytical Instant Water Converter (NCIWC) equipment for water and wastewater treatment	JV Tyagi, RP Pandey, Rajesh Singh (PI), Sumant Kumar, VK Tyagi, MK Sharma, P Kumar	06 Months (05/22-11/22) <b>Funded by:</b> Envirogreen Minotech India Pvt. Ltd., Indore, M.P. <b>Cost:</b> Rs. 5.90 Lakhs
14.	Hydrological Study for Water Availability Assessment in Sukhnai River and Runoff Diversion to Saprar Dam	RP Pandey (PI), P Kumar (Co-PI), Rajesh Singh, VK Tyagi, Kalzang Chhoden, Shakti Suryavanshi, Shailendra Kumre	06 Months (03/23-09/23) <b>Funded By:</b> Irrigation Deptt., UP Govt. <b>Cost:</b> Rs.29.50 Lakhs
15.	Hydrological Study for Design of Drainage System for Safe Disposal of Upland Runoff Passing through New Kendriya Vidyalaya Campus Bhimtal	RP Pandey (PI), P Kumar (Co-PI), Rajesh Singh, VK Tyagi, Kalzang Mathus, Shakti Suryavanshi, Shailendra Kumre	03 Months (07/23 - 10/23) <b>Funded By:</b> CPWD, Haldwani <b>Cost:</b> Rs.9.44 Lakhs
16.	Sampling/Analysis of Ground water samples for confirming the present status of petroleum contamination at Akolner Village, Tal. & Dist. Ahmednagar, Maharashtra	Sudhir Kumar, RP Pandey, MK Sharma (PI), P Kumar, Rajesh Singh	03 Months (07/23-09/23) <b>Funded by:</b> MPCB, Nasik <b>Cost:</b> Rs.17.70 Lakh
17.	Analysis of Water and Soil Samples for Major Ions, Trace Metals and Isotope Studies	Sudhir Kumar, RP Pandey, MK Sharma (PI), SS Rawat, P Kumar, Kalzang Chhoden	6 months (08/23-01/24) <b>Funded by:</b> Geosciences Consultancy Services, Roorkee <b>Cost:</b> Rs. 2.95 Lakh <b>Status:</b> On-going
<b>Consultancy Projects (Ongoing)</b>			
18.	Water Quality Studies for Tehri Reservoir Tehri HPP (4x250MW)	Sudhir Kumar, RP Pandey, MK Sharma (PI), P Kumar, Rajesh Singh, SK Kumre	2 Years (02/23-01/25) <b>Funded by:</b> THDC, India Limited <b>Cost:</b> Rs. 6.91 Lakh <b>Status:</b> In-Progress
19.	Preparation of District/State Action Plans for Source Sustainability of Drinking Water Supply Schemes under Jal Jeevan Mission, Uttarakhand	RP Pandey (PI), Rajesh Singh (Co-PI), P Kumar, MK Sharma, VK Tyagi, Kalzang Chhoden, PK Sahoo, Shakti Suryavanshi, Shailendra Kumre	08 Months (10/23-06/24) <b>Funded by:</b> Uttarakhand Jal Jeevan Mission <b>Cost:</b> Rs. 1.06 Crore <b>Status:</b> In-Progress



## GROUNDWATER HYDROLOGY DIVISION

### Approved Work Programme for the year 2023-24

S. No.	Project	Project Team	Duration & Status	Funding Source
<b>Internal Studies</b>				
1. <u>NIH/GWH/22-25</u>	Studying arsenic genesis and developing alternate water supply management strategies in Ganga basin	Sumant Kumar(PI), Surjeet Singh Nitesh Patidar Rajesh Singh Gopal Krishan M.K. Sharma Vinay Tyagi Soban Singh Rawat P.K. Mishra	3 years (04/22 – 03/25) Status: <b>In-progress</b>	Internal Study
2. <u>NIH/GWH/22-24</u>	Conjunctive Management of Water Resources in IGNP Command	Nitesh Patidar (PI), M. K. Goel, Anupma Sharma, Surjeet Singh, Gopal Krishan, Sumant Kumar	2 years (04/22 – 03/24) Status: <b>In-progress</b>	Internal Study
3. <u>NIH/GWH/22-24</u>	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: <b>Dropped</b>	Internal Study
4. <u>NIH/GWH/23-24</u>	Development of Archive of Soil Hydraulic Characteristics	Surjeet Singh (PI) Nitesh Patidar, M.K. Goel, Anupma Sharma	1 year (04/23 – 03/24) Status: <b>In-progress</b>	Internal Study
5. <u>NIH/GWH/23-25</u>	Enhancement and application of NIH_WISDOM	Nitesh Patidar (PI) Deepak Singh Bisht, M.K. Goel, T. Thomas, Sunil Gurrapu, Anupma Sharma, Surjeet Singh	2 years (10/23 – 09/25) Status: <b>In-progress</b>	Internal Study
<b>Sponsored Projects</b>				
6. <u>NIH/GWH/CEHM/18-22</u>	Integrated Management of Water Resources for Quantity and Quality in Upper Yamuna Basin up to Delhi	Anupma Sharma (PI) S. K. Jain, A. Sarkar, M. K. Sharma, L. N. Thakural, S. Kumar, P.K. Mishra, V. Singh, N. Patidar, R. Kale <i>Partners Haryana Irr. &amp; WR Dept., UPGWD, UYRB, CWC</i>	4 years (04/18-03/24) Status: <b>In-progress</b>	Special Project under “Centre of Excellence” (NHP)
7.	Enhancing Food and Water Security	Anupma Sharma	5 years	DST

<u>NIH/GWH/DST/19-23</u>	in Arid Region through Improved Understanding of Quantity, Quality and Management of Blue, Green and Grey Water	(PI), Gopal Krishan, Nitesh Patidar (Lead: CAZRI Jodhpur, Partners: NIH Roorkee, IISWC Dehradun, CSWRI & CIAH, Bikaner, NIAM Jaipur)	(03/19 - 07/24)  Status: <b>In progress</b>	
8. <u>NIH/GWH/NHP(PDS)/2019-2024</u>	Leachate Transport Modeling for Gazipur landfill site for suggesting ameliorative measures	Er. Anjali (PI) Sudhir Kumar J. V. Tyagi, M. K. Sharma,	4years (11/19 - 03/24) Status: <b>In progress Shifted from HID</b>	NHP (PDS)
9. <u>NIH/GWH/BGS/17-20</u>	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)  Status: <b>In progress Shifted to HID</b>	BGS, UK
10. <u>NIH/GWH/CCRBF/20-23</u>	Expansion of the Indo-German Competence Centre for Riverbank Filtration – CCRBF	Gopal Krishan (PI & Co-coordinator)	3 years (07/20 – 03/24) Status: <b>In progress Shifted to HID</b>	Federal Min. of Education and Research, Germany
11. <u>NIH/GWH/DST-SERB/21-24</u>	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) Status: <b>In progress Shifted to HID</b>	DST-SERB

## HYDROLOGICAL INVESTIGATIONS DIVISION

### Approved Work Programme for the year 2023-24

S. N.	Project Title	Study Team	Duration	Status
<b><u>INTERNAL STUDIES:</u></b>				
1.	Hydrogeological and Isotopic investigation of groundwater in Himalayan Watershed of Kashmir, India	Gopal Krishan (PI) M.S. Rao <i>SKUAST-Srinagar</i> Rohitashv Kumar	1.5 years (09/22 – 03/24)	On-going
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)	On-going
3.	Runoff and Water Storage Capacity Estimation Using Different Resolutions of Topographic Data for Deciding Rainwater Harvesting Strategies	S.M. Pingale(PI) Soban Singh Rawat, S. D. Khobragade Rajeev Gupta	2 Years (04/23-03/25)	On-going
4.	Sedimentation and Water Quality Study of Fulhar Lake, Pilibhit (U.P.)	Rajeev Gupta (PI), S. D. Khobragade, S.M. Pingale	2 Years (04/23-03/25)	On-going
5.	Developing a Stable Isotopic Analysis System for Analyzing the Dissolved Nitrates in Water	Dr M Someshwar Rao, Mr VishalGupta,	1 and half yrs 04/23-09/24	Proposed Dropped
<b><u>SPONSORED PROJECTS:</u></b>				
1.	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, M. S. Rao <i>BGS, UK:</i> Dr. Dan Lapworth Dr. Alan MacDonald Dr. Daren Goody BGS, UK	5 years (12/17-11/24)	On-going
2.	Expansion of the Indo-German Competence Centre for Riverbank Filtration – CCRBF	Gopal Krishan (PI & Co-coordinator) Federal Min. of Education and Research, Germany	3 years (07/20 – 06/23)	On-going
3.	Partitioning Evapotranspiration into Evaporation and Transpiration fluxes using Stable Isotopes of Oxygen and Hydrogen	Gopal Krishan (PI), MS Rao DSTSERB	3 years (04/21 – 03/24)	On-going
4.	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	Dr. M. K. Sharma ( <b>PI</b> ), Ms. Anjali, Dr. Vishal Singh, Dr. SM Pingale, Dr.Suhas Khobragade, Dr. Pradeep Kumar, Dr.Nitesh Patidar, Dr. Surjeet Singh.	5years (04/22-03/27)	On-going

**SURFACE WATER HYDROLOGY DIVISION**

**Approved Work Programme for the year 2023-24**

<b>ONGOING STUDIES (SPONSORED)</b>			
<b>S. No. &amp; Ref. Code</b>	<b>Title</b>	<b>Study Team</b>	<b>Duration</b>
1. NIH/SWHD/20-23  MoE- STARS/STARS- 1/743	Operational coastal flood management through short-to-medium range (real-time) flood vulnerability mapping in the Brahmani-Baitarani River Basin integrating human and climate induced impacts (Funded under STARS by MHRD, GoI)	B. Sahoo, (PI, IIT-Kgp) R. V. Kale, (Co-PI)	04 years (July, 2020 – June, 2024)
<b>COMPLETED STUDIES (INTERNAL)</b>			
<b>S. No. &amp; Ref. Code</b>	<b>Title</b>	<b>Study Team</b>	<b>Duration</b>
1.NIH/SWHD/22-24	Development of Cloud Data Based Integrated Framework to Forecast Flood for Efficient Operation of Reservoirs	A. K. Lohani R. K. Jaiswal J.P. Patra P. C. Nayak Vishal Singh	Two Years April 2022 – March 2024
2. NIH/SWHD/23-24	Hydraulic force-inversion equation for exact modeling of hydraulic jumps in rectangular channels	Sushil K. Singh	One Year (April 2023 to March 2024)
<b>ONGOING STUDIES (INTERNAL)</b>			
<b>S. No. &amp; Ref. Code</b>	<b>Title</b>	<b>Study Team</b>	<b>Duration</b>
1.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)
2.NIH/SWHD/22-25	Hydrological Study for revival and restoration of traditional water bodies in Bikaner, Rajasthan	L. N. Thakural M. K. Shama R. K. Jaiswal J. P. Patra P. K. Mishra Nitesh Patidaar N. K. Bhatnagar Jatin Malhotra Anil Kumar Chhangani	2 Year (Apr 2022 to Mar 2024)
3.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 Jatin Malhotra	3 Year (April 2022 to March 2025)

4.NIH/SWHD/22-25	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) [ <b>Transferred to C4S</b> ]
5.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) [ <b>Transferred to WRSD</b> ]
6.NIH/SWHD/21-24	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 River basin	R. V. Kale A. K. Lohani J. P. Patra D. Khurana	03 Years (September 2021-October 2024)
7.NIH/SWHD/23-25	Estimation of confidence intervals of index flow duration curves	Sanjay Kumar, Sunil Gurrapu L. N. Thakural J. P Patra	02 Years (April 2023 to March 2025)
8.NIH/SWHD/23-24	Hydrologic and hydraulic study for Jata Ganga river at Jageshwar dham	J.P. Patra A. K. Lohani Pankaj Mani D. S Bisht S. S. Rawat	01 Years (July 2023 to July 2024)

**WATER RESOURCES SYSTEMS DIVISION**

**Approved Work Programme for the year 2023-24**

<b>SN</b>	<b>Title</b>	<b>Study Team</b>	<b>Duration</b>	<b>Funding (Rs. Lakhs)</b>
<b>Ongoing Sponsored/ Internal Studies</b>				
1.	Snow and glacier contribution and impact of climate change in Teesta river basin in Eastern Himalaya	P K Singh; Vishal Singh; A K Lohani	3 years (11/19-11/22) Extended up to 03/24	NMHS- MoEF (143)
2.	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	2 years (08/20-07/22) Extended up to 03/24	NHP (14.50)
3.	Monitoring and hydrological modeling of Henva watershed in Lesser Himalaya	M K Nema; P K Mishra	3.5 years (08/20-03/24)	NIH (10.22)
4.	Development of Water Accounts for the selected sub-basins of Brahmaputra, Barak and Irrawady-Chindwin basins in the state of Nagaland using Water Accounting Plus (WA+) Framework.	P K Mishra; P K Singh	2 years (04/21-06/23) Extended up to 03/24	NHP (9.00)
5.	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; Harsh Upadhyay; Abhilash R.	3 years (04/22-03/25)	NHP (54.0)
6.	Spatio-temporal Water Availability under Changing Climate and Land-use Scenarios in Wainganga River Basin	M K Nema; P K Mishra	3 years (04/22-03/25)	NIH (9.72)
7.	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; Charu Pandey	2 years (05/22-04/24)	NIH
8.	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; P. K. Mishra; Praveen Thakur (IIRS)	3 years (04/22-03/25)	IIRS (30.91)
9.	Hydrology-based scenario planning for water productivity and optimization of income from farming practices in Mewat region, Haryana	A. R. Senthil Kumar Omkar Singh Rajesh Agarwal N. R. Allaka	(09/20-08/22) (Ext. upto 06/23)	NIH

**CENTRE FOR CRYOSPHERE AND CLIMATE CHANGE STUDIES**

**Approved Work Programme for the year 2023-24**

	<b>Project Title</b>	<b>Study Team</b>	<b>Duration</b>	<b>Status</b>
<b><u>INTERNAL STUDIES:</u></b>				
1. NIH/C4S/20 22- 2025/SSR-1	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, DS Bisht, Rajesh Singh	3 years (04/22-03/25)	Ongoing
2. NIH/C4S/20 23- 2026/SSR-2	Geo-Hydro-Chemical and Isotopic Aspects of occurrence of Springs: A case study from the major settlement areas of Bhagirathi basin, Uttarakhand, India	S S Rawat (PI), Suhas Khobragade, M K Sharma, M S Rao, Santosh M. Pingale, P K Mishra	03 Years (04/23 -03/26)	Ongoing
3. NIH/C4S/20 23-2028/VS	Real time monitoring of snow-glacier related parameters and Ensemble Hydrological Modeling (EHM) to study the Triloki Group of Glaciers and Khatling glaciers part of Western Himalaya, India under climate change scenarios	Vishal Singh (PI), Surjeet Singh, Sunil Gurrapu, Luvkush Patel, Akshay Verma, Madhusudan Thapliyal	05 Years (03/23-02/28)	Ongoing
4. NIH/C4S/20 22-2024/SG	Climate Change Scenarios for Andhra Pradesh and its impact on streamflow and groundwater levels in Pennar River Basin	Sunil Gurrapu (PI)	02 years (04/22-03/24)	Completed
5. NIH/C4S/20 22-2025/AR	Investigation on occurrences of extreme rain events across Northwest Himalaya in relation to global atmospheric thermal and circulation changes	Ashwini Ranade, PK Mishra, Sunil Gurrapu	03 years (04/22-03/25)	Ongoing
6. NIH/C4S/20 21- 2024/DSB-1	Early Signatures of 21st Century on Snow Cover Dynamics in Zanskar River Basin, Ladakh	DS Bisht (PI) & PG Jose	03 years (07/21-03/24) <b>(Extension needed up to 06/2024)</b>	Ongoing
7. NIH/C4S/20 22- 2024/DSB-2	Comparative Analysis of Fine Scale Satellite & Reanalysis Precipitation Products in Upper Ganga Basin using Multicriterion Decision-Making	DS Bisht (PI) & MK Goel	02 years (06/22-03/24) <b>(Extension needed up to 06/2024)</b>	Ongoing

	<b>Project Title</b>	<b>Study Team</b>	<b>Duration</b>	<b>Status</b>
8. NIH/C4S/2023-2026/LKP-1	Monitoring and Modelling of the Gangotri glacier catchment under different Climate Scenarios	Lavkush Kumar Patel (PI), Akshaya Verma, Vishal Singh, Kapil Kesharwani, Surjeet Singh, Jatin Malhotra	03 years (04/23-03/26)	Ongoing
<b><u>SPONSORED PROJECTS:</u></b>				
9. SP/C4S/2023-2028/SSR	Identification of Source and Causes of the gushing water in the premises of Jaypee Colony in the night of 02 January, 2023	SS Rawat (PI), Gopal Krishan, Rajesh Singh, SM Pingale, JP Patra	04 Month (01/23-04/23) Sponsored by Uttarakhand State Disaster Management Authority (USDMA)	Completed
10. SP-54	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 subbasins in the state of Mizoram (SP-54)	Vishal Singh	2.5 years (06/21-03/24)  <b>Sponsored PDS under NHP</b>	Completed
11. SP65/2023-26/NIH(CHD)	Assessment of glacier-climate functional relationships across the Indian Himalayan region through long-term network observations	Vishal Singh, Lead Co-PI, NIH Roorkee	03 years (12/23-11/26)  <b>Sponsored by NMHS-GBPNIHE</b>	Ongoing
<b><u>CONSULTANCY PROJECTS:</u></b>				
12. CS-257/2022-23/GWHD	System Studies for Proposed Farakka-Sundarban Link Project	Surjeet Singh (PI)	1.5 years (12/22-05/24)  <b>Sponsored by NWDA</b>	Ongoing



**HARD ROCK REGIONAL CENTRE, BELAGAVI**

**Approved Work Programme for the year 2023-24**

S. N.	Title of the Study	Study Team	Duration
<b>R &amp; D Studies (On-going)</b>			
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)
2.	Comprehensive Assessment of Hydrology of Large Rivers basins of Western Ghats of Karnataka	Venkatesh.B (PI) Abhilash.R. N. Varadarajan	3 year (4/23-4/26)
3.	Studies on Occurrence, Distribution of Springs in parts of Western Ghats, India	Abhilash.R. (PI) Venkatesh.B.	1 year (4/23-3/24)
4.	Water Productivity assessment in Irrigation Projects by Geo-Spatial Optimization Techniques	Abhilash.R. (PI) Venkatesh.B.	3 year (4/23-4/26)
<i>Sponsored Studies (On-going)</i>			
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)
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
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)

**WESTERN HIMALAYAN REGIONAL CENTRE, JAMMU**

**Approved Work Programme for the year 2023-24**

<b>S. No.</b>	<b>Title of the Study</b>	<b>Study Team</b>	<b>Duration</b>
<b>R &amp; D Studies (On-going)</b>			
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 (08/2020 – 03/2023) Extn. up to 10/2023
2.	Early signatures of 21 <sup>st</sup> Century on snow cover dynamics in Zaskar River Basin, Ladakh	D. S. Bisht P. G. Jose	02 Years (07/2021 -06/2023) Extn. up to 12/2023
3.	Investigation of hydrodynamic approach of flood inundation mapping and assessment of changes in river planforms using a cloud-based GEE platform in data-scarce Western Himalayan basin	R. V. Kale A. K. Lohani J. P. Patra D. Khurana	03 Years (09/2021-07/2024)
4.	Mass balance of Phuche and Khardung glaciers, Ladakh Range with implications for downstream water availability under changing climate.	P. G. Jose D. S. Bisht D. Khurana	03 Years (07/2021- 06/2024)
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 (06/2022 – 05/2023) Extn. up to 12/2023
<b>Sponsored Studies (On-going)</b>			
6.	Permafrost mapping and characterization of Western Himalayan Region	P. G. Jose A.P. Dimri (JNU) G. Jeelani (KU) V. Agnihotri (GBPNIHESD)	04 years (08/2019- 03/2024) funded under NMHS

**CENTRAL INDIA HYDROLOGY REGIONAL CENTRE, BHOPAL**

**Approved Work Programme for the year 2023-24**

<b>SN</b>	<b>Title of the Study</b>	<b>Study Team</b>	<b>Duration</b>
<b>R &amp; D Studies (On-going)</b>			
1.	Re-assessment of evapotranspiration ( <i>ET<sub>o</sub></i> ) estimation for irrigation planning in Madhya Pradesh	<b>NIH</b> R.V. Galkate, R.K. Jaiswal A.K. Lohani Shashi Induwar <b>MP-WRD, Bhopal</b> Deepak Satpute Sayyam Jhanjari Sameer Soni	3 years (Nov 2021 – Oct 2024)
2.	Water Availability Assessment for Project Formulation in Sub Basins of Ganga River in Madhya Pradesh	<b>NIH</b> R K Jaiswal, Ravi Galkate, A K Lohani. <b>MP-WRD, Bhopal</b> B Baghel	3 years (Nov 2021 – Oct 2024)
3.	Development of Reservoir Operation Plan under Climate Change scenarios for Kolar reservoir	<b>NIH</b> Shashi Induwar, T. Thomas, R. K. Jaiswal, R.V. Galkate, <b>MP-WRD, Bhopal</b> C.E, Hoshangabad, S.E Kolar, E.E Kolar.	3 years (Oct 2021 – Sept 2024)
<b>Sponsored Studies (On-going)</b>			
4.	Integrated Assessment of the Impacts of Climate Change and Land-use Change on the Hydrology of the Narmada basin through Hydrological Modelling Approaches	<b>NIH</b> T. Thomas, B. Venkatesh, P. C. Nayak, Surjeet Singh, Shashi Induwar <b>MP-WRD, Bhopal</b> Director Hydromet Mahesh Paliwal, B. Baghel.	5 years (Feb 2018 – Sep 2023) Special PDS under NHP
5.	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	<b>NIH</b> R K Jaiswal, Ravi Galkate, T Thomas Shashi Induwar, A K Lohani, Sudheer Kumar, Surjeet Singh <b>MP-WRD, Bhopal</b> Director, Hydromet,	4 years (Apr 2019 – Sept 2023) PDS under NHP

		SE, GW circle, Database Admin, SE, EE, and AEs of Bah Project	
6.	Integrated reservoir operation studies for Mahanadi reservoir project complex in Chhattisgarh: SP-56/2021-22/NIH (CIHRC)	<b>NIH</b> R K Jaiswal, Ravi Galkate, Shashi Induwar, A. K. Lohani, M. K. Goel, Vishal Singh, Sumit Saini, Dipti Rani <b>WRD Chhattisgarh</b> A. Verma, J. K. Das, V. K. Dubey, A. Gupta, P. Awadhiya <b>IGKV Raipur</b> S. Chandinah	2 years (Apr 2022-Mar 2024) Special Project under NHP
<b>Sponsored Studies (New)</b>			
7.	Assessment of impact of climate change on water resources in Shipra river basin	<b>NIH, Bhopal</b> Ravi Galkate, R. K. Jaiswal, Shashi Induwar, <b>RNTU, Bhopal</b> Shalini Yadav, S. K. Sharma	3 years from the date of award (INCCC, M/o Jal Shakti)
8.	Water Resource Management for Tawa Reservoir Project under Climate Change	<b>NIH, Bhopal</b> R. K. Jaiswal, Ravi Galkate, Shashi Indwar, <b>MPU Bhopal</b> R N Yadav, M P Verma	3 years from the date of award (INCCC, M/o Jal Shakti)

**DELTALIC REGIONAL CENTRE, KAKINADA**

**Approved Work Programme for the year 2023-24**

<b>S.No.</b>	<b>Title of the Study</b>	<b>Study Team</b>	<b>Duration</b>
<b>R &amp; D Studies (On-going)</b>			
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 <i>Ext. 03/24</i>
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
<b>R &amp; D Studies (New)</b>			
3.	Storm water flood Management in the coastal city - A case study	R. Venkata Ramana (PI) Y R Satyaji Rao (PI) V. S. Jeyakanthan Sabyasachi Swain	2 years (04/23 – 03/25)
4.	Climate Change Impact Assessment under Future Scenarios over the East Coast of India: A focus on the Hydroclimatic Extremes	Sabyasachi Swain (PI) Y.R. Satyaji Rao V.S.Jeyakanthan R Venkata Ramana	2 years (04/23 – 03/25)
5.	Evaluation and post-processing of multi-model short-to-medium-range precipitation forecasts: Towards developing a flood early warning system over Subarnarekha Basin	Sabyasachi Swain (PI) Y.R. Satyaji Rao Biswajeet Pradhan Saswata Nandi	3 years (04/23 – 03/26)
<b>Sponsored Study (On-going)</b>			
6.	High Performance Advanced Septic System for Villages and Roadside Restaurants	Y.R. Satyaji Rao (PI) T.Vijay	3 Years 04/18 – 12/22 <i>Extended</i> (IC – IMPACT Canada)
<b>Sponsored Study (New)</b>			
7.	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 (Project yet to be awarded by MoES)

**NORTH EASTERN REGIONAL CENTRE, GUWAHATI**

**Approved Work Programme for the year 2023-24**

<b>Sl. No.</b>	<b>Title of the Study</b>	<b>Study Team</b>	<b>Duration</b>
<b>R &amp; D Studies (On-going)</b>			
1.	Drought characterization and vulnerability assessment in Assam	WR Singh, S Barman, SK Sharma, SV Vijaya Kumar, AK Lohani	2 Years (7/22 – 6/24)
<b>R &amp; D Studies (New)</b>			
2.	Short Term Flood Forecasting Using Bootstrap based Artificial Neural Networks within Beki River basin.	S.K. Sharma, S. Barman, S. Arora, S.V. Vijaya Kumar, A.K. Lohani	1 Year (7/23 – 6/24)
3.	Linear Hydrological routing using Satellite precipitation datasets for flood forecasting in parts of Brahmaputra Basin	W. R. Singh Swapnali Barman, S. Arora, S.V. Vijaya Kumar,	1.5 years (9/23-2/25)
4.	Rainfall Induced Flood Hazard Risk Vulnerability Assessment in East Jaintia Hills, Meghalaya	S. K. Sharma S. Barman, S. Arora, S. V. Vijaya Kumar,	1.5 years (9/23-2/25)
5.	Hydrodynamic modelling for riverbank protection- A case study	Swapnali Barman, W. R. Singh, S Arora, S. K. Sharma S. V. Vijaya Kumar	1.5 years (9/23-2/25)
<b>Sponsored Study (On-going)</b>			
6.	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 (04/21-03/24) Under DST-SERB (Power Grant)

**CENTRE FOR FLOOD MANAGEMENT STUDIES, PATNA**

**Approved Work Programme for the year 2023-24**

<b>Sl</b>	<b>Title of the Study</b>	<b>Study Team</b>	<b>Duration</b>
<b>R &amp; D Study (On-going)</b>			
1	Design flood estimation for small structures in the South Bihar area.	Pankaj Mani (PI), J P Patra, Pravin Rangrao Patil & Director WALMI	2 years (04/21-09/23)
<b>R &amp; D Studies (New)</b>			
1	Influence of non-stationarity on flood frequency analysis for South-Bihar region	Pravin Rangrao Patil (PI) Pankaj Mani Suryansh Mandloi	02 years (05/23-03/25)
2	Evaluation of hydrologic models for Gandak river basin	Suryansh Mandloi (PI) Pankaj Mani Pravin Rangrao Patil	02 years (05/23-03/25)
<b>Sponsored Study (On-going)</b>			
1.	Modeling and management of erosion and sedimentation processes in a reach of Gandak river using morphodynamic modeling	Pankaj Mani (PI) J P Patra Pravin Rangrao Patil Suryansh Mandloi & WRD Bihar	3 years (05/21-04/24) Under NHP (PDS)

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