National Institute of Hydrology, Roorkee

Minutes of the 55th Meeting of NIH Working Group (28-30 April, 2025)

The 55th meeting of NIH Working Group (WG) was held during 28-30 April, 2025 at Roorkee under the Chairmanship of Dr. M. K. Goel, Director (NIH). A list of participants of meeting is given in Annexure-I.

Item No. 55.1: Opening Remarks by the Chairman

The Chairman welcomed the WG members and the Scientists of NIH. He informed that the objective of this meeting is to review the progress of 2024-25 and to formulate the work program for 2025-26. Before initiating proceedings of the WG meeting, the Chairman requested the WG members to give their general observations, suggestions and remarks on the scientific activities of the Institute. These are summarized below:

S. No.	Member	Suggestion(s)
1.	Dr. Bhishm Kumar	• Develop an Excel-based research database from IDR (Institutional Digital Repository or other Reports) to catalog ongoing and completed research projects, thereby preventing duplication of work. • Create a central repository of all Institutes research papers for easy access and knowledge sharing. • Integrate all results of laboratory-analyzed data into a structured and efficient retrieval system. Software like Lab-Pro, which is specially developed to integrate data of Soil and Water Lab, should also be used in other labs of NIH to integrate their data. • A High-Level Technical Committee should review research concepts and problematic areas before they are proposed to the Working Group for discussion or approval.
2.	Sh. Sudhindra Mohan Sharma	• Enhance visibility of completed studies through mass media and social media, including short documentary films and visual storytelling. • Explore opportunities to monetize research studies through knowledge services, consultancy, or collaborations, with appropriate recognition of their impact. • Ensure that each research outcome highlights sustainability points and real-world societal relevance. • Emphasize presentation uniformity in terms of design, formatting, and clarity to improve comprehension and professional appeal.
3.	Dr. R. K. Singh	• Mandate the preparation of research notes by Principal Investigators (PIs) and Co-PIs to document objectives, progress, and deliverables. • Adopt a comprehensive budgeting model integrated with Decision Support Systems like DSS-PM, covering all research aspects. • Prioritize publications in reputed, peer-reviewed journals, making it a requirement for all major research outputs.
4.	Dr. (Mrs.) Sadhana Malhotra	• Streamline presentation slides by limiting content per slide, focusing on key messages and visual clarity. • Encourage regular training in soft skills such as time management, teamwork, presentation skills, and effective communication, especially for young researchers and project teams.
5.	Prof. Ramakar Jha	Various suggestions/observations on completed/ongoing/new studies have been included in the minutes of respective divisions.
6.	Dr. Praveen Thakur	Various suggestions/observations on completed/ongoing/new studies have been included in the minutes of respective divisions.
7.	Dr. S. S. Grewal	Various suggestions/observations on completed/ongoing/new studies have been included in the minutes of respective divisions.

After brief introduction about NIH activities, the Chairman asked the Member-Secretary to take up the agenda of this meeting.

Item No. 55.2: Confirmation of Minutes of 54th Meeting of Working Group

The 54th meeting of the Working Group was held during 22-23 February, 2024. The minutes of the meeting were circulated to all the members and invitees vide letter No. **RMOD/WG/NIH-10 dated 15 May, 2024.** The members confirmed the minutes of the 54th Working Group meeting.

Item No. 55.3: Actions Taken on Decisions/Recommendations of the Previous Working Group Meeting

Dr. Sanjay Kumar, Scientist F & Head (Technical Cell) and Member Secretary gave a brief account of the actions taken on the recommendations/ decisions of the 54th Working Group meeting. He mentioned that details of these action taken will be elaborated during the presentation of respective divisions.

Item Nos. 55.4 & 55.5: Presentation and Discussion on the Status and Progress of Work Program for Year 2024-25 and Finalization of Work Programme for Year 2025-26

The Member-Secretary requested the respective Divisional Heads to present the progress of studies carried out during 2024-25 and also to present the proposed studies for the year 2025-26. Accordingly, the progress of various studies and sponsored projects, and proposal for new studies and projects during 2025-26, were presented by all Scientific Divisions during the three-day deliberations of the Working Group. The outcome of the Division-wise study/project presented during the meeting are detailed in the following.

Centre for Cryosphere and Climate Change Studies (C4S)

The overview of the technical activities of the Centre for Cryosphere and Climate Change Studies (C4S) was presented by Dr. Surjeet Singh, Scientist 'G' & Head. The Working Group was appraised about the scientific manpower, status of completed and ongoing studies, consultancy projects, publications, and technology transfer activities. Dr. Singh also informed that a **Na**tional **Mo**nitoring System for **H**imalayan Cryosphere (NaMoH) portal has been developed by the Centre and a Spring Cell has been created under the Centre. Subsequently, the scientists of the Division were invited to present the completed studies, progress of ongoing internal studies and proposed new studies. The Comments/suggestions of Working Group members are summarized below:

Progress of Work Program for the Year 2024-25

S. No.	Title of Project/Study	Recommendations/ Suggestions
	Internal Studies (Completed)	
1	Investigation on occurrences of extreme rain events across Northwest Himalaya in relation to global atmospheric thermal and circulation changes **Study Group:** Ashwini Ranade (PI), P K Mishra, Sunil Gurrapu **Duration:** 3 Years (April 2022 – March 2025) **Status:** Completed	Members appreciated the work and proposed to include a summary of key findings in the project report in a way relevant to stakeholders in the disaster management and climate change policy makers. The members also encouraged to publish the findings in high-quality journal.
2	Climate Change Scenarios for Andhra Pradesh and its impact on streamflow and groundwater levels in Pennar River Basin **Study Group:** Sunil Gurrapu (PI), YRS Rao, RV Ramana, Nitesh Patidar, TVNAR Kumar, CE, WRD, GoAP **Duration:** 2 Years (April 2022 – March 2024) **Status:** Completed	The study was briefly described.
3	Assessment of Hydrological Extremes and Impact on Future Water Availability in Pennar River Basin under Changing Climate **Study Group:** Sunil Gurrapu (PI), Surjeet Singh, Vishal Singh, YRS Rao, RV Ramana, Madhusudan Thapliyal, TVNAR Kumar, CE, WRD, GoAP **Duration:** 1 Year (April 2024 – March 2025) **Status:** Completed	The study was briefly described.
4	Early Signatures of 21st Century on Snow Cover Dynamics in Zanskar River Basin, Ladakh **Study Group:** DS Bisht (PI), PG Jose **Duration:** 3 Years (July 2021- June 2024) **Status:** Completed	The study was briefly described.
5	Comparative Analysis of Fine-scale Satellite & Reanalysis Precipitation Products in Upper Ganga Basin using Multi-Criterion Decision-Making **Study Group:** DS Bisht (PI), MK Goel **Duration:** 2 Years (June 2022- June 2024) **Status:** Completed	No specific comments.

S. No.	Title of Project/Study	Recommendations/ Suggestions
6	Ascertaining the efficacy of use of State-of-the-art technologies for spring mapping and sustainability of springs through suitable interventions **Study Group:** SS Rawat (PI), Sudhir Kumar, SM Pingale, PK Mishra, DS Bisht, Rajesh Singh **Duration:** 3 Years (April 2022 – March 2025) **Status:** Completed (draft report by May, 2025)	No specific comments.
Internal Studies (Ongoing)		
7	Geo-Hydro-Chemical and Isotopic Aspects of occurrence of Springs: A case study from the major settlement areas of Bhagirathi basin, Uttarakhand, India **PI: Dr. S. S. Rawat**	No specific comments.
8	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 **PI: Dr. Vishal Singh**	No specific comments.
9	Monitoring and Modelling of the Gangotri glacier catchment under different Climate Scenarios **PI: Dr. Luvkush Kumar Patel**	Dr. Bhishm Kumar suggested to include isotopic observations and comparing results with the past data for better assessment of contributions of melt-runoff.
10	Updation of Glaciers and Glacial Lakes in Indian Himalayan Region **PI: Dr. Surjeet Singh**	This study was dropped as Space Application Centre (SAC) is already working on this aspect.
11	Glacio-hydrological and GLOF investigations over the Triloki glacier, Bhaga basin, Western Himalaya **PI: Dr. Luvkush Kumar Patel**	No specific comments.
12	WRF-based dynamical downscaling of CMIP6 climate projections over Himalaya and surrounding Region **PI: Dr. Kuldeep Sharma**	No specific comments.
13	Integrated long-term monitoring of Khatling Glacier, Bhilangana basin, Uttarakhand **PI: Dr. Akshaya Verma**	Dr. S. S. Grewal suggested to explore the study on Hemkund Sahib glaciers.
14	A Spatially Explicit Assessment of CMIP6 General Circulation Models for Indian Himalayan Region **PI: Dr. D. S. Bisht**	The study was briefly described.
15	Climate change impacts on water resources availability and hydropower potential assessment in the Himalayan Satluj river basin (up to Kasol) **PI: Sh. Rajat Kumar**	Members suggested to incorporate sediment yield analysis by collecting data available with BBMB and also visit field to get more understanding of local water and sediment related problems.
16	Influence of Climate Change and Future Response of the Milam Glacier(Central Himalaya, India): Science – Practice – Policy	No specific comments.

S. No.	Title of Project/Study	Recommendations/ Suggestions
	PI: Dr. Kapil Kesarwani	
Sponsored/Collaborative Projects (Completed)		
1	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 **Study Group:** Dr.Vishal Singh (PI) **Duration:** 2.5 Years (June 2021- Sept. 2024) **Status:** Completed	The study was briefly described.
Sponsored/Collaborative Projects (Ongoing)		
2	Assessment of glacier-climate functional relationships across the Indian Himalayan region through long-term network observations **PI: Dr. Vishal Singh**	The study was briefly described.
3	Isotopic and Hydrogeochemical Characterization of Hot Springs of Uttarakhand Himalayas **PI: Dr. S. S. Rawat**	No specific comments
4	Influence of climate change on Debris-covered Milam Glacier (Goriganga River Basin, Central Himalaya, India): Monitoring and Modelling of Physical Processes Governing Snow and Glacier-fed Watershed Dynamics **PI: Dr. Kapil Kesarwani**	The study was briefly described.
Consultancy Studies (Completed)		
1	System Studies for Proposed Farakka-Sundarban Link Project	Completed.
New Internal Studies		
1	Exploring Atmospheric conditions and Triggering Mechanisms of Cloudburst Events in the Northwestern Himalayas **PI: Dr. Ashwini Ranade**	Members suggested to explore possible collaborations with other institutes like IMD and IITM.
2	Seasonal Variability of Sediment Flux in Meltwater Streams of Himalayan Glacier System **PI: Sh. Jatin Malhotra**	Members suggested to redefine the title and objectives of the study to align with the scope of C4S.

Recommended Work Program of C4S for the Year 2025-26

S. No.	Title of Project/Study	Study Team	Duration	Funding
Internal Studies (11)				
1	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 S M Pingale P K Mishra	3 Years (04/23 -03/26) Ongoing	NIH
2	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 Lavkush Patel Akshaya Verma Madhusudan Thapliyal	5 Years (03/23-02/28) Ongoing	NIH
3	Monitoring and Modelling of the Gangotri glacier catchment under different Climate Scenarios	**Lavkush Kr Patel (PI)** Akshaya Verma Vishal Singh Kapil Kesarwani Surjeet Singh Jatin Malhotra	3 years (04/23-03/26) Ongoing	NIH
4	Glacio-hydrological and GLOF investigations over the Triloki glacier, Bhaga basin, Western Himalaya	**Lavkush Kr Patel (PI)** Akshaya Verma Vishal Singh Surjeet Singh	3 years (03/24-03/27) Ongoing	NIH
5	WRF-based dynamical downscaling of CMIP6 climate projections over Himalaya and surrounding Region	**Kuldeep Sharma (PI)** Ashwini Ranade Sahidul Islam, Associate Director, CDAC, Pune	3 years (04/24-03/27) Ongoing	NIH
6	Integrated long-term monitoring of Khatling Glacier, Bhilangana basin, Uttarakhand	**Akshaya Verma (PI)** Vishal Singh Sunil Gurrapu Lavkush Patel Surjeet Singh	4 years (04/24-03/28) Ongoing	NIH
7	A Spatially Explicit Assessment of CMIP6 General Circulation Models for the Indian Himalayan Region	**Deepak Singh Bisht (PI)** Nitesh Patidar S S Rawat Surjeet Singh	2 years (04/24-03/26) Ongoing	NIH
8	Climate change impacts on water resources availability and hydropower potential assessment in the Himalayan Satluj river basin (up to Kasol)	**Rajat Kumar (PI)** Vishal Singh Surjeet Singh Shakti Suryavanshi	2 years (04/24-03/26) Ongoing	NIH
9	Influence of Climate Change and Future Response of the Milam Glacier (Central Himalaya, India): Science – Practice - Policy	**Kapil Kesarwani (PI)** Surjeet Singh Lavkush Kumar Patel D S Bisht Akshaya Verma Madhusudan Thapliyal	3 years (04/24-03/27) Ongoing	NIH
10	Exploring Atmospheric conditions and Triggering Mechanisms of Cloudburst Events in the Northwestern Himalayas	**Ashwini Ranade (PI)** Kuldeep Sharma	3 years (04/25-03/28) New	NIH
11	Seasonal Variability of Sediment Flux in Meltwater Streams of Himalayan Glacier System	**Jatin Malhotra (PI)** Vishal Singh Kapil Kesarwani	3 years (04/24-03/28) New	NIH

S. No.	Title of Project/Study	Study Team	Duration	Funding
		Sumit Rai, Sc D, GBPIHE Madhusudan Thapliyal		
Sponsored/Collaborative Projects				
1	Assessment of glacier-climate functional relationships across the Indian Himalayan region through long-term network observations	**Vishal Singh (PI)**	3 years (12/23-11/26) Ongoing	Sponsored by NMHS-GBPNIHE
2	Isotopic and hydrogeochemical characterization of hot springs of Uttarakhand Himalayas	**S S Rawat (PI)** Tripti Muguli Amit Pandey Akshaya Verma	3 years (09/24-08/26) Ongoing	Sponsored by UCOST
3	Influence of climate change on Debris-covered Milam Glacier (Goriganga River Basin, Central Himalaya, India): Monitoring and Modelling of Physical Processes Governing Snow and Glacier-fed Watershed Dynamics	**Kapil Kesarwani (PI)**	3 years (02/23-02/26) Ongoing	Sponsored by DST
4	Impact of Climate Change on the Glaciers in Indus basin and its Impact on water availability over the coming decades	**Vishal Singh (PI)** Surjeet Singh Deepak Singh Bisht Kuldeep Sharma Akshaya Verma Sachchidanand Singh, WHRC, Jammu	3 years (04/25-03/28) New	Sponsored by DoWR, RD&GR, MoJS
Consultancy Studies (1)				
1	Flood Plain Zoning of Khokhari River (Length ~45.5) for Districts Saharanpur and Shamli Districts	**Vishal Singh (PI)**	6 Months (04/25-09/25) New	Sponsored by Irrigation Construction Division, Saharanpur (UP)

Environmental Hydrology Division

Dr. Y. R. Satyaji Rao, Scientist 'G' & Head, presented an overview of the technical activities of the Environmental Hydrology Division (EHD). The Working Group was briefed on the scientific manpower, the status of completed and ongoing studies, consultancy projects, publications, and technology transfer initiatives. Following this, the division's scientists were invited to present the completed studies, the progress of ongoing internal studies, and the proposed new studies. The comments and suggestions provided by the Working Group members are summarized below.

Progress of Work Program for the Year 2024-25

S. No.	Study	Recommendations/Comments
	Internal Projects (Completed)	
1	**Title:** Understanding Arsenic mobilization in groundwater of Haridwar and formulating remediation measures **Study Group:** Rajesh Singh (PI), Sumant Kumar, Pradeep Kumar, M. K. Sharma, V. K. Tyagi, Kalzang Chhoden **Duration:** 4 Years (July 2021 – April 2025) **Status:** Completed	Dr. Rajesh Singh presented the study's progress. The members acknowledged the quality of the work and provided the following recommendations: • Dr. Bhishm Kumar recommended conducting isotopic analyses of precipitation, the Solani River water, and the Ganga River water to better characterize and differentiate groundwater recharge sources. He also advised using distinct symbols to represent isotope signatures from shallow and deep wells for improved data visualization. • Dr. Sudhindra Mohan Sharma suggested distinguishing between shallow and deep groundwater sampling points in graphical representations through the use of differentiated color coding.
2	**Title:** Simulation of Non-Point Source Pollution Processes in Song River **Study Group:** Pradeep Kumar (PI), M.K. Sharma, Rajesh Singh, Shakti Suryavanshi, SK Kumre **Duration:** 5 Years (11/19-03/25) **Status:** Completed	Dr. Pradeep Kumar presented the progress of the study. The members appreciated the study and recommended preparing and submitting a concise summary report to the beneficiary organization for further action.
	Sponsored Projects (Completed)	
3	**Title:** Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS) **Study Group**: Rajesh Singh (PI), VC Goyal, Omkar Singh, Jyoti Patil, VK Tyagi, Kalzang Chhoden **Partners:** MNIT-Jaipur, IIT-Bombay, IRMA-Anand **Duration:** 6 Years (04/19-01/25). **Sponsored by**: DST **Status:** Completed	Dr. Rajesh Singh provided an update on the study's progress and key findings, and informed the group that the final report has been completed.
4	**Title:** Irrigation efficiency improvement for Shahnehar medium irrigation project **Study Group**: Rajesh Singh (PI), RP Pandey, Shakti Suryavanshi, SK Kumre, JP Patra	The study's progress was reported in the Working Group meeting. The PI informed that the study has been concluded and the report has been submitted to NHP.

S. No.	Study	Recommendations/Comments
	Duration: 6 Years (12/17-09/24) **Status:** Completed	
	Collaborative R&D Projects (Completed)	
5	**Title:** Isotopic and geochemical approach to study vulnerable confined and unconfined drinking water aquifers in Varanasi and surrounding area, India **Study Group**: Rajesh Singh (PI), R.P. Pandey **Collaborators:** BHU, Varanasi (Lead), BARC, Mumbai, ICER, Hungary. **Duration:** 4 Years (07/21-03/25) **Sponsored by**: BHU **Status**: Completed	Dr. Rajesh Singh reported that the study was conducted in collaboration with partner institutions and that the final report is currently under preparation.
	Internal Projects (Ongoing)	
6	**Title:** Hydrological Studies for the Conservation of Rewalsar Lake **PI: Dr. Kalzang Chhoden**	Dr. Kalzang Chhoden presented the progress of the study along with the planned future activities. The members acknowledged the quality of the work and offered the following suggestion: Prof. Ramakar Jha recommended standardizing the dissolved oxygen (DO) values to 20 °C to facilitate accurate comparison of DO levels with those observed in other high-altitude lakes.
7	**Title:** Comprehensive evaluation of disinfection units of STPs in Ganga basin: Formation & Control of emerging oxidation precursors. **PI: Dr. Vinay Kumar Tyagi**	Dr. Vinay Kumar Tyagi presented the progress of the study and future planned activities. The progress of the study was appreciated by the members and the following suggestions were made: • Prof. A. A. Kazmi recommended conducting controlled experiments using incremental chlorine dosages in the range of 5–10 ppm to evaluate disinfection efficiency and the formation of trihalomethanes (THMs). • Dr. Sudhindra Mohan Sharma suggested developing correlation graphs between chlorine dosage and free residual chlorine levels for the sewage treatment plants under study.
8	**Title:** Nanotechnology-enabled multifunctional materials for the detection and remediation of arsenic in contaminated water. **PI: Dr. P. K. Sahoo**	Dr. Prasanta Kumar Sahoo presented the progress of the study to the Working group. The members made the following suggestions: • Dr. Sudhindra Mohan Sharma recommended exploring options to enhance cost-effectiveness and efficiency of the developed material. • Prof. A. A. Kazmi suggested evaluating the performance of existing arsenic (As) removal systems currently deployed in the field.
9	**Title:** Land and water management plan for rejuvenation of river Manorama **PI: Dr. Shakti Suryavanshi**	Dr. Shakti Suryavanshi presented the progress of the study along with the planned future activities. The members appreciated the quality of the work and provided the following suggestions- • Prof. Ramakar Jha recommended incorporating a time series analysis of rainfall and river discharge data. He also suggested analyzing concentrations of key agricultural pollutants (N, P, K) in both river and groundwater samples. • Dr. R. K. Singh suggested estimating the siltation rate in the river.

S. No.	Study	Recommendations/Comments
		• Dr. S. S. Grewal recommended considering the use of floating wetlands as a component of the proposed remedial or mitigation measures.
10	**Title:** Evaluation of Groundwater Quality of Tripura with emphasis on Arsenic and Fluoride **PI: Dr. Rajesh Singh**	Dr. Rajesh Singh reported the progress of the study and future planned activities.
11	**Title:** Environmental flow requirements at critical stretches of River Yamuna **PI: Dr. S. K. Kumre**	Dr. S.K. Kumre presented the progress of the study and outlined the planned future activities. No specific comments or suggestions were provided by the members.
12	**Title:** Rainfall-Runoff-Sediment yield modelling to assess water availability and sediment loads **PI: Dr. Shakti Suryavanshi**	Dr. Shakti Suryavanshi presented the progress of the study and future planned activities. No specific comments or suggestions were provided by the members.
Sponsored Projects (Ongoing)		
13	**Title:** 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 **PI: Dr. M. K. Sharma**	Dr. Sharma presented the progress on the ongoing project. Dr. Lohani enquired about the criteria of the selection of the different locations of piezometric wells along River Hindon. Dr. Sharma explained that the piezometric wells along River Hindon were drilled before and after confluence of River Hindon with tributaries as well as accessibility. In response to a query from Dr. Bhishm Kumar regarding groundwater and surface water interaction across different seasons, Dr. Sharma added that monthly monitoring is being conducted to study this aspect. The Working Group members appreciated the study.
14	**Title:** Development of Innovative sewage treatment technology with a minimum energy requirement **PI: Dr. Vinay Kumar Tyagi**	Dr. V.K. Tyagi reported the progress of the study and future planned activities.
15	**Title:** Bio-Hythane production from Hydrothermally pretreated OFMSW and Sewage Sludge **PI: Dr. Vinay Kumar Tyagi**	Dr. V.K. Tyagi reported the progress of the study and future planned activities.
16	**Title:** Environmental Flow Assessment for Chambal, Sone, Damodar and Tons Rivers at Critical Reaches **PI: Dr. Pradeep Kumar**	Dr. Pradeep Kumar reported the progress of the study and future planned activities.
Collaborative R&D Projects (Ongoing)		
17	**Title:** SARASWATI 2.0 - Identifying best available technologies for decentralized wastewater treatment and resources recovery for India **Dr. Vinay Kumar Tyagi (Co-PI)** **Prof. A. A. Kazmi (PI, IITR)** **Duration:** 4 Years (03/20-02/24)	Dr. Vinay Kumar Tyagi informed that the study is being conducted in collaboration with IIT Roorkee. He reported that the study is nearing completion, and the final report will be submitted to the sponsor.
Internal Studies (New)		
18	**Title:** Fate and transport of agricultural pollutants in unsaturated zones of Yamuna River Basin **PI: Dr. Poonam Rana**	Er. Poonam presented the proposed plan of study. The Working Group members agreed on the objectives and the necessity of the proposed study. The following suggestion was made:

S. No.	Study	Recommendations/Comments
		Dr. Bhishm Kumar recommended utilizing existing data to delineate potential hotspot regions and validating these findings with field data.
19	**Title:** Evaluating the impact of toilets on groundwater and surface water in diverse hydrogeological and climatic conditions **Study Group:** Y. R. Satyaji Rao (Lead PI), Rajesh Singh (PI), Vinay Kumar Tyagi, Kalzang Chhoden, Shakti Suryavanshi, Poonam Team of scientists from NIH-WHRC, NIH-NWHC, NIH-CFMS, NIH-NERC, NIH-HRRC, NIH-DRC	Dr. Y. R. S. Rao presented the proposed plan of activities for the study. The members appreciated the proposed work and offered the following suggestion: • Dr. Bhishm Kumar recommended considering groundwater levels and soil types when selecting study sites. • Prof. A. A. Kazmi suggested utilizing isotopic techniques to delineate the sources of pollution, including greywater, cattle waste, and agricultural return flow. • Prof. Ramakar Jha advised referring to previous studies related to twin pit latrines for relevant insights.
20	**Title:** Nitrate-organic-bacteria nexus in mobilization of naturally occurring arsenic in groundwater **Study Group:** Rajesh Singh (PI), YRS Rao, Sumant Kumar, VK Tyagi, MK Sharma, Kalzang Chhoden, PK Sahoo, Poonam, Prashant Rai (CGWB, DDN)	The study was postponed due to the number of ongoing studies within the division, and it was suggested that this important study be undertaken at a later stage.

Recommended Work Program of EHD for the Year 2025-26

S. No.	Study Title	Study Team	Duration/Status	Funding
Sponsored R&D Projects (Ongoing)				
1.	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	**M K Sharma (PI)**	5 Years (2022-2027) **Status**: Ongoing	DST
2.	Development of Innovative sewage treatment technology with a minimum energy requirement	**Vinay K. Tyagi (PI)** Rajesh Singh (Co-PI) Collaborators: IIT Roorkee -Prof. C.S.P Ojha -Prof. A A Kazmi	3 yr (08/24-07/27) **Status**: Ongoing	Tehri Hydro Development Corporation Ltd.
3.	Bio-Hythane production from Hydrothermally pretreated OFMSW and Sewage Sludge	**Vinay K. Tyagi (PI)** Rajesh Singh (Co-PI) Collaborators: IIT Roorkee -Prof. C.S.P Ojha -Prof. A A Kazmi	3 yr (08/24-07/27) **Status**: Ongoing	Tehri Hydro Development Corporation Ltd.
4.	Environmental Flow Assessment for Chambal, Sone, Damodar and Tons Rivers at Critical Reaches	**Pradeep Kumar (PI)** and team of scientists from EHD, GWHD, C4S, WRSD **Collaborators:** WII, Dehradun (UK), ICAR-CIFRI, Barrackpore (WB)	3 Years (12/24-11/27) **Status**: New	NMCG
Collaborative R&D Projects (Ongoing)				
1.	SARASWATI 2.0 - Identifying best available technologies for decentralized wastewater treatment and resources recovery for India	**V K Tyagi (Co-PI)** **A A Kazmi (PI, IITR)**	5 Years (03/20-06/25) **Status**: In-progress	DST
Internal Study (Ongoing)				
2.	Hydrological Studies for the Conservation of Rewalsar Lake	**Kalzang Chhoden (PI)** Rajesh Singh Y R S Rao Pradeep Kumar V K Tyagi S D Khobragade Shakti Suryavanshi S K Kumre D S Malik, GKU, Haridwar	3 Years (04/23-03/26) **Status:** In-Progress	NIH
3.	Comprehensive evaluation of disinfection units of STPs in Ganga basin: Occurrence and control the formation of emerging oxidation precursors	**V K Tyagi (PI)** Rajesh Singh M K Sharma Pradeep Kumar J P Patra Kalzang Chhoden Y R S Rao	3 Years (04/23-03/26) **Status:** In-Progress	NIH
4.	Nanotechnology-enabled multifunctional materials for the detection and remediation of	**P K Sahoo (PI)** Rajesh Singh M K Sharma	3 Years (04/24-03/27)	NIH

S. No.	Study Title	Study Team	Duration/Status	Funding
	arsenic in contaminated water	Pradeep Kumar V K Tyagi Sumant Kumar Kalzang Chhoden	**Status:** In-Progress	
5.	Land and water management plan for rejuvenation of river Tilodki Ganga, Ayodhya	**S Suryavanshi (PI)** S K Kumre R P Pandey Pradeep Kumar Rajesh Singh M K Sharma V K Tyagi	3 Years (04/24-03/27) **Status:** In-Progress	NIH
6.	Evaluation of groundwater quality of Tripura with emphasis on arsenic and fluoride	**Rajesh Singh (PI)** V K Tyagi M K Sharma P K Sahoo Kalzang Chhoden Shakti Suryavanshi S K Sharma Swapnali Barman W R Singh	3 Years (04/24-03/27) **Status:** In-Progress	NIH
7.	Comprehensive hydrological study for river health assessment and development of environmental management plan for River Yamuna	**Pradeep Kumar** (Lead-PI) and team of scientists from EHD, GWHD & HI	5 Years (04/24 - 03/29) **Status:** In-Progress	NIH
8.	Environmental flow requirements at critical stretches of River Yamuna	**S K Kumre (PI)** Pradeep Kumar Shakti Suryavanshi Rajesh Singh	3 Years (04/24-03/27) **Status:** In-Progress	NIH
9.	Rainfall-Runoff-Sediment yield modelling to assess water availability and sediment loads	**S Suryavanshi (PI)** S K Kumre Pradeep Kumar	3 Years (04/24-03/27) **Status:** In-Progress	NIH
Internal Study (Proposed)				
10.	Fate, transport, and health risks of agricultural pollutants in the Yamuna River Basin: An integrated modelling and experimental approach	**Poonam Rana (PI)** Y R S Rao M K Sharma Pradeep Kumar Rajesh Singh V K Tyagi Kalzang Chhoden Shakti Suryavanshi S K Kumre	3 Years (04/25-03/28) **Status**: Proposed	NIH
11.	Evaluating the impact of toilets on groundwater and surface water in diverse hydrogeological and climatic contexts without sewage treatment facilities	**Y R Satyaji Rao (PI)** Rajesh Singh Vinay Kumar Tyagi Kalzang Chhoden Shakti Suryavanshi Poonam	3 Years (04/25-03/28) **Status**: Proposed	NIH
12.	Nitrate-organic-bacteria nexus in mobilization of naturally occurring arsenic in groundwater	**Rajesh Singh (PI)** Y R S Rao Sumant Kumar V K Tyagi M K Sharma	3 Years (04/25-03/28) **Status**: Proposed	NIH

S. No.	Study Title	Study Team	Duration/Status	Funding
		Kalzang Chhoden P K Sahoo Poonam Prashant Rai (CGWB, DDN)		
Consultancy Projects (Ongoing)				
13.	Preparation of District/State Action Plans for Source Sustainability of Drinking Water Supply Schemes under Jal Jeevan Mission, Uttarakhand	**R P Pandey (Retd.)** **Rajesh Singh (PI)** Pradeep Kuma, M K Sharma V K Tyagi Kalzang Chhoden Shakti Suryavanshi S K Kumre	2 Years (10/23-07/25) **Status:** In-Progress	UK-JJM
14.	Site assessment for potential damage to the environment caused by pesticide manufacturing industry located at RIICO industrial area, Sotanala, Behror (Rajasthan)	**M K Sharma (PI)** Sumant Kumar	0.5 Year (03/25-08/25) **Status:** In-Progress	Rajasthan Pollution Control Board, Jaipur
15.	Hydrogeological Study of Feroze Gandhi Unchahar Thermal Power Station, Unchahar	**Rajesh Singh (PI)** Y R S Rao M K Sharma, Pradeep Kumar V K Tyagi Kalzang Chhoden P K Sahoo Skakti Suryavanshi S K Kumre	1.5 Year (03/25-07/26) **Status:** In-Progress	GCS, Roorkee
16.	Prioritization of Sub-catchments of the Song and Nayar River Catchments for Development of River Rejuvenation Plan	**Pradeep Kumar (PI)** Y R S Rao S S Rawat Shakti Suryavanshi S K Kumre S M Pingale	04 Month (11/24-03/25) **Status:** In-progress (Draft Report submitted)	Watershed Management Directorate, Uttarakhand
17.	Preparation of NGT Joint Committee Report on Solani River Catchment	**Y R S Rao (PI)** Pradeep Kumar V K Tyagi Rajesh Singh Shakti Suryavanshi S K Kumre	03 Month (11/24-03/25) **Status:** In-Progress	Uttarakhand State Pollution Control Board

Groundwater Hydrology Division

Dr. Anupma Sharma, Scientist-G and Head, Groundwater Hydrology Division (GHD), made a brief presentation about the present manpower of the division, the attached Soil-Water Laboratory and Centre of Excellence for Advanced Groundwater Research, thrust areas of the division, work program and major achievements during the year 2024–25, and the proposed work program for the year 2025-26. She informed that, in addition to significant progress in various studies and sponsored projects, work on the development of one software tool "LabPro" has been completed. The LabPro tool, which is a Laboratory Data Processing System, will be implemented in the Soil-Water Laboratory. Significant progress was reported in the major project on the Luni River Basin, which aims to improve understanding of groundwater dynamics and inform sustainable water resource management in the region. Notably, the Groundwater Hydrology Division successfully organized the International Ground Water Conference (IGWC 2025) jointly with Hydrological Investigations Division, from 5th to 7th March, 2025 at NIH, Roorkee on the theme 'Groundwater Vision 2047: Towards Water Security under Changing Climate'. The conference was organized in association with the Central Ground Water Board (CGWB); Association of Global Groundwater Scientists (AGGS); National Mission for Clean Ganga (NMCG); National River Conservation Directorate (NRCD); British Geological Survey (BGS), United Kingdom; Hochschule für Technik und Wirtschaft (HTW) Dresden, Germany; and KTH-Royal Institute of Technology, Stockholm, Sweden. More than 400 leading national and international experts in the field of groundwater research participated in the event.

Subsequently, detailed presentations on various studies were made by the respective Scientists (PIs) of various studies. Sponsored studies, except for one, were not presented. The recommendations/ comments of the Working Group members on these studies are summarized below.

Progress of Work Program for the Year 2024-25

S. No.	Title of Project/Study	Recommendations/Comments
	Internal Studies (Completed)	
1.	Studying arsenic genesis and developing alternate water supply management strategies in Ganga basin **Study Group:** Sumant Kumar (PI), Surjeet Singh, Nitesh Patidar, Rajesh Singh, Gopal Krishan, M K Sharma, Vinay Tyagi, S S Rawat, P K Mishra **Duration:** 3 years (04/2022-03/2025) **Status:** Completed	• Dr. Bhishm Kumar suggested that the PI consult with him regarding the isotopic data to enhance its interpretation. • The Director, NIH suggested the PI to submit the report of the study.
2.	Conjunctive Management of Water Resources in IGNP Command **Study Group:** Nitesh Patidar (PI), M K Goel, Anupma Sharma, Surjeet Singh, Gopal Krishan, Sumant Kumar **Duration:** 2 years (04/2022-03/2024) **Status:** Completed	• Sh. Sudhindra K. Sharma suggested to explore if the outcomes of the study can be utilized for policy making for conjunctive use.
3.	Development of Archive of Soil Hydraulic Characteristics	• Dr. Bhishm Kumar recommended that NIH should consider implementing the LabPro system in other laboratories of the Institute.

S. No.	Title of Project/Study	Recommendations/Comments
	Study Group: Nitesh Patidar (PI), Surjeet Singh, M K Goel, Anupma Sharma **Duration:** 1 year (04/2023-03/2024) **Status:** Completed	
	Internal Studies (Ongoing)	
4.	Enhancement and application of NIH_WISDOM **PI: Dr. Nitesh Patidar**	• The Director suggested that the model application be conducted in the Yamuna River basin instead of the Ganga basin. • Based on the Principal Investigator's request, the members recommended extending the study period until March 2026.
5.	Surface water-groundwater interactions through field techniques and hydrological modelling in Yamuna basin **PI: Dr. Sumant Kumar**	• Members suggested plotting the groundwater level (GWL) data alongside rainfall data to enable better interpretation of GWL fluctuations.
6.	Estimation of Soil Characteristics and Groundwater Recharge in the Luni River Basin **PI: Dr. Satendra Kumar**	• Dr. R. K. Singh suggested to include hydrological parameters in the study.
7.	Hydrogeochemical Evolution and role of Paleochannels on groundwater quality in the Luni Basin **PI: Dr. Ajit Kumar Behera**	• No specific comments were received from the members.
8.	Aquifer parameters estimation in the Luni River Basin **PI: Sh. Pintu Kumar Gupta**	• Sh. Sudhindra K. Sharma recommended re-verifying the aquifer parameters obtained from the CGWB brochure/ publication.
9.	Characterization and Modeling of Multi Aquifer System of LUNI River Basin in Rajasthan Under Climate and Anthropogenic Influences **PI: Dr. L. Surinaidu**	• No specific comments were received from the members.
	Sponsored Projects (New)	
1.	Use of deep learning models to understand the impact of climate and land use changes on future groundwater resources, with a focus on data scarce regions. **PI: Dr. L. Surinaidu**	The study was briefly described.
2.	Preparation of Status Reports of the Salinity Ingress in Coastal Area of Saurashtra and Kachchh, Gujarat State. **Former PI: Dr. Anupma Sharma** **PI: Dr. L. Surinaidu** **PI: Dr. Ajit Kumar Behera**	The study was briefly described.
3.	Modelling Micro-Plastic Movement through soil Matrix: A step towards Plastic waste management **PI: Mrs. Anjali**	No specific comments were received from the members.

S. No.	Title of Project/Study	Recommendations/Comments
Internal Studies (New)		
1.	Prediction of Groundwater levels Using Machine Learning Techniques in the Luni River Basin, Rajasthan **PI: Dr. Sushindra K. Gupta**	• Dr. Ramakar Jha suggested reconsidering the use of REPTree, BFTree, CART, AdaBoost-REPTree, and AdaBoost-CART models. • Dr. Ramakar Jha recommended adopting Random Forest and XGBoost, as these models are more commonly used in groundwater studies.

Recommended Work Program of GHD for the Year 2025-26

S. No.	Project	Project Team	Duration	Funding
Internal Studies				
1.	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)	NIH
2.	Surface water-groundwater interactions through field techniques and hydrological modelling in Yamuna basin	**Sumant Kumar (PI)** Nitesh Patidar Lagudu Surinaidu Pintu Gupta Ajit Kumar Behera Anupma Sharma Shailendra Kumre Gopal Krishan	3 years (04/24– 03/27)	NIH
Major Project with Sub-Projects **S. No. 3-6** "Enhancing the Sustainability of Water Resources Through Integrated Assessment and Management Techniques in the LUNI River Basin – Rajasthan" Project Coordinator – Head, Groundwater Hydrology Division				
3.	Estimation of Soil Characteristics and Simulation of Groundwater Recharge in the Luni River Basin	**Satendra Kumar (PI)** Anupma Sharma L. Surinaidu Ajit K. Behera Pintu K. Gupta Nitesh Patidar Sushindra Kumar Gupta	2 years (04/24– 03/26)	NIH
4.	Hydrogeochemical Evolution and role of Paleochannels on groundwater quality in the Luni Basin	**Ajit Kumar Behera (PI)** L. Surinaidu Akshay Vyankat Dahiwale Satendra Kumar Pintu Kumar Gupta Anupma Sharma M. K. Sharma, A. H. Laskar (PRL)	3 years (04/24– 03/27)	NIH
5.	Aquifer parameters estimation in the Luni River Basin	**Pintu Kumar Gupta (PI)** L. Surinaidu Nitesh Patidar Ajit Kumar Behera Satendra Kumar Sudesh Chaudhary Sushindra Kumar Gupta	2 years (04/24– 03/26)	NIH
6.	Characterization and Modeling of Multi Aquifer System of LUNI River Basin in Rajasthan Under Climate and Anthropogenic Influences.	**L. Surinaidu (PI)** Anupma Sharma Ajit Kumar Behera Sumant Kumar Sudesh Chaudhary	3 years (04/24– 03/27)	NIH
Sponsored Projects				
1.	Use of deep learning models to understand the impact of climate and land use changes on future groundwater resources, with a focus on data scarce regions.	**L.Surinaidu (PI from NIH)** Lead agency: IIT-Hyderabad Partner: McGill University-Canada	2 years (06/23-07/25)	DST-SERB

S. No.	Project	Project Team	Duration	Funding
2.	Preparation of Status Reports of the Salinity Ingress in Coastal Area of Saurashtra and Kachchh, Gujarat State	**L. Surinaidu** Ajit Behera Anupma Sharma Nitesh Patidar Sourabh Nema Sudesh Chaudhary Malkhan Singh Jatav (a) Madhavpur-Okha reach & Maliya-Lakhpat reach - L. Surinaidu (PI) (b) Bhavnagar-Una reach & Okha-Maliya reach – Ajit Behera (PI)	2 years (04/24–03/26) Status: **Transferred from RC Jodhpur**	GWRDC
3.	Modelling Micro-Plastic Movement through soil Matrix: A step towards Plastic waste management	**Anjali (PI)** Sunil Gurrapu Ajay Ahirwar Prof. C.S.P. Ojha (IITR)	3 years 03/24 – 02/27	THDC
Internal Studies (New)				
1.	Prediction of Groundwater levels Using Machine Learning Techniques in the Luni River Basin, Rajasthan	**Sushindra Kr. Gupta (PI)** Sumant Kumar L. Surinaidu Satendra Kumar Nitesh Patidar Pintu Kr. Gupta	2 years 11/24 – 03/26	Initiated internally in Nov. 2024

Hydrological Investigations Division

Dr Suhas Khobragade, Scientist-G and Head of the H. I. Division (HID) presented the brief details of the Division including the scientific staff strength and infrastructure. He briefly introduced about the scientific work of the Division and the various studies being carried by the Division, along with details about the publications by the Division and analytical work carried out at the Nuclear Hydrology Laboratory.

The progress of each individual study for the year 2024-25 and the proposal for the new studies was presented by the respective P.I. of the study.

Progress of Work Program for the Year 2024-25

S. No.	Title of study	Comments/suggestions
	Internal Studies (Completed)	
1	Assessment of the Possible Impact of Climate Change on Evapotranspiration for Different Climatic Regions of India **Study Group:** Dr.SD Khobragade (PI), Dr.Vishal Singh **Duration:** 3 years (April 2022-March 2025) **Status:** Completed	Shi. S. M. Sharma suggested presenting the results of future PET as percentage change and not absolute change in the final report.
2	Sedimentation and Water Quality Study of Fulhar Lake, Pilibhit (U.P.) **Study Group:** Sh. Rajeev Gupta (PI), Dr. S D Khobragade, Dr. S M Pingale **Duration:** 2 years (April 2023-March 2025) **Status:** Completed	No specific comments/suggestions received.
	Internal Studies (Ongoing)	
3	Runoff and Water Storage Capacity Estimation for Deciding Rainwater Harvesting Strategies **PI: Dr. S. M. Pingale**	Prof. Ramakar Jha recommended to use CARTOSAT 5.8 m DEM data as well.
4	Development of radiocarbon dating facility **PI: Dr. Tripti Muguli**	Working Group agreed to extend the activity by one year.
5	Hydrological and hydrogeological investigations in the Yamuna river basin using isotopic and geochemical techniques **PI: Dr. Tripti Muguli**	Director, NIH suggested: • Additional river water samples may be collected in the u/s and d/s of major cities like Delhi, Agra, etc. • Additional groundwater samples may also be collected around major cities like Delhi, Agra, etc. at different distances from river location. Dr. Bhishm Kumar suggested that interaction of shallow and deep groundwater in the river basin at selected stations may be studied.
6	Understanding Surface Water Groundwater Interactions in the Narmada River Basin and its Hydrological Implications **PI: Dr. Amit Pandey**	Dr. Bhishm Kumar suggested that the anomalous isotopic signature observed in the Upper Narmada River requires verification.
7	Quantifying Current and Future Meteorological Drought Characteristics and Identifying Risk Zones in Central India	No specific comments/suggestions received.

S. No.	Title of study	Comments/suggestions
	PI: Sh. Ruchir Patidar	
Sponsored Studies (Completed)		
8	Partitioning Evapotranspiration into Evaporation and Transpiration fluxes using Stable Isotopes of Oxygen and Hydrogen **Study Group:** Dr. Gopal Krishan (PI), Dr. MS Rao **Duration:** 3 years (April 2021-March 2024) **Status:** Completed	No specific comments/suggestions received.
Sponsored Studies (ongoing)		
9	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*)* **PI: Dr. Gopal Krishan**	No specific comments/suggestions received.
Internal Studies (New)		
1	Unraveling summer monsoon and westerly influences incursions in the Himalayan basins using stable isotopes **PI: Dr. Gopal Krishan**	The Director suggested: • To change the title "westerly influences" to "western disturbances" • To delete the 3rd objective on "hydrological extremes"
2	Isotopic and Arsenic Investigations in the Amritsar Transboundary Region **PI: Dr. Gopal Krishan**	• The Director suggested to change the title to "Amritsar region" in place of "Amritsar transboundary region" • Prof. Ramakar Jha suggested to check the groundwater gradient in the area. • Dr. S.S. Grewal suggested to review the work done by agriculture universities in this regard.
3	Isotopic & Geochemical Studies, Behal & Loharu Block of Bhiwani District, Haryana **PI: Dr. Gopal Krishan**	Dr. Bhishm Kumar suggested to use N15 isotopes to find the sources
4	Investigations of Water Sources and Hydrological Behaviour of Two Small Lakes at Sri Badrinath, Uttarakhand **PI: Dr. S. M. Pingale**	No specific comments/suggestions received
5	Investigations on water and sediment dynamics in a tropical ocean and its relation to climate **PI: Dr. Tripti Muguli**	It was suggested to taken up this study as a collaborative internal study.

Recommended Work Programme of HID for the Year 2025-26

S. No.	Project Title	Study Team	Duration	Status
		Internal Studies		
1	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 M K Nema Ruchir Patidar Rajeev Gupta	2 Years (04/23- 3/25) Extended till 06/25	On-going
2	Development of radiocarbon dating facility	**Tripti Muguli (PI)** Someshwar Rao Amit Pandey	1 year (04/24-03/25) Extended till 03/26	On-going
3	Hydrological and hydrogeological investigations in the Yamuna river basin using isotope geochemistry	**Tripti Muguli (PI)** S D Khobragade Someshwar Roa Ruchir Patidar Vipin K Agrawal Amit Pandey	3 years (04/24-03/27)	On-going
4	Understanding Surface Water Groundwater Interactions in the Narmada River Basin and its Hydrological Implications	**Amit Pandey (PI)** S D Khobragade Someshwar Rao Tripti Muguli	3 years (04/24-03/27)	On-going
5	Quantifying Current and Future Meteorological Drought Characteristics and Identifying Risk Zones in Central India.	**Ruchir Patidar (PI)** S M Pingale S D Khobragade Kuldeep Sharma	3 years (04/24-03/27	On-going
		Sponsored Projects		
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*)*	**NIH, Roorkee:** **Gopal Krishan (PI)** S Singh M S Rao **BGS, UK:** **Dan Lapworth** Alan MacDonald Daren Goody BGS, UK	5 years (12/17-11/24) Extended till 11/26	On-going
		New Studies		
1	Unraveling summer monsoon and western disturbance influences incursions in the Himalayan basins using stable isotopes	**NIH, Roorkee:** **Gopal Krishan (PI)** S D Khobragade Amit Pandey **IIRS-Dehradun:** **Praveen Thakur (PI)** Arpit Chouksey	2 years (04/25 – 03/27)	New Study
2	Isotopic and Arsenic Investigations in the Amritsar Region	**NIH, Roorkee:** **Gopal Krishan (PI)** S D Khobragade Amit Pandey **CGWB, Chandigarh:** **Amandeep Kaur** Manish Srivastav Kiran Lale	2 years (04/25 – 03/27)	New Study

S. No.	Project Title	Study Team	Duration	Status
3	Isotopic & Geochemical Studies, Behal & Loharu Block of Bhiwani District, Haryana	**NIH, Roorkee:** **Gopal Krishan (PI)** S D Khobragade Ruchir Patidar Raj Kumar Dewansi **CGWB, Chandigarh:** Naima Akhtar Rishi Raj Sunil Kumar	1 year (04/25 – 03/26)	New Study
4	Investigations of Water Sources and Hydrological Behaviour of Two Small Lakes at Sri Badrinath, Uttarakhand	**S M Pingale (PI)** Ruchir Patidar Amit Pandey S D Khobragade	2 years (04/25 – 03/27)	New Study
5	Investigations on water and sediment dynamics in a tropical ocean and its relation to climate	**NIH Roorkee:** **Tripti M.** S D Khobragade **BSIP, Lucknow:** **Gurumurthy, G.P.**	1 year (04/25 – 03/26)	New Study

Surface Water Hydrology Division

Dr. A.K. Lohani, Sc G & Head, Surface Water Hydrology Division (SWHD) presented various activities of the division. The number of research papers published in various journals, lectures delivered in various training courses and number of M.Tech./Ph.D. students guided/under guidance during the period were also reported. The concerned PI of the study presented the progress of his/ her completed and new internal studies during the working group meeting. The record of discussions for the respective study is given below:

Progress of Work Program for the Year 2024-25

S. No.	Title of Project/Study	Recommendations/Suggestions
	Sponsored Studies (Completed)	
1.	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 **Study Group:** B. Sahoo (PI, IIT-KGP), RV Kale (Co-PI) **Duration:** 4 Years (July 2020- June 2024) **Status:** Completed	No specific action suggested.
	Internal Studies (Completed)	
1.	Hydrological Study for revival and restoration of traditional water bodies in Bikaner, Rajasthan **Study Group:** LN Thakural, RK Jaiswal, JP Patra, PK Mishra, Nitesh Patidar, NK Bhatnagar, Jatin Malhotra, AK Chhangani **Duration:** 3 Years (Apr 2022 - March 25) **Status:** Completed	PI presented the background, objectives and the methodology and the results for the study. Data and methodology related to the objectives was discussed and presented including Trend analysis of rainfall, temperature and GW level for the Bikaner district, Surface water availability, soil loss assessment from the catchment of selected water bodies. The Water Quality Assessment for various parameters for the water bodies were presented. Moreover, significant variability in runoff across catchments from 2001 to 2020, influenced by factors like soil, vegetation, and topography, was presented. Site-specific approaches for revival and restoration of the water bodies were also presented. The queries and questions from the working group members concerning methodology and results were explained and answered.
2.	Review of design flood and dam break analysis of Khadakhai Dam in Odisha **Study Group:** JP Patra, AK Lohani, Pankaj Mani, PC Nayak, Sanjay Kumar, Jatin Malhotra **Duration:** 3 Years (Apr 2022- March 2025) **Status:** Completed	No specific action suggested.
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 River basin **Study Group:** RV Kale, AK Lohani, JP Patra,	The study was presented by PI of the study. The results of planform changes in the Tawi river basin during 1988 to 2022 were analysed using Landsat satellite datasets. Further, the flood inundation mapping results by both the 2D RRI and HEC-RAS models were analysed and it was concluded that the results achieved with both the

S. No.	Title of Project/Study	Recommendations/Suggestions
	D Khurana **Duration:** 3 Years (Sept.2021- Oct. 2024) **Status:** Completed	hydraulic models were comparable. The queries and questions related to the methodologies were thoroughly explained and addressed. The members did not provide any specific comments or suggest any particular actions regarding the study.
4.	Estimation of confidence intervals of index flow duration curves **Study Group:** Sanjay Kumar, Sunil Gurrapu, LN Thakural, JP Patra **Duration:** 2 Years (Apr 2023 – March 2025) **Status:** Completed	PI presented the analysis and results under two objectives using daily discharge data at Chindnar and Polavaram gauging sites in Lower Godavari basin. The Annual Flow Duration Curves (AFDC), index flow duration curves and their 90% confidence interval have been estimated and plotted. The study also estimated the flow duration curves corresponds to different return periods (2, 5, 20, 50) for probability of exceedance and probability of non-exceedance. The queries and questions regarding methodology were explained and answered. There were no specific comments from members
5.	Hydrologic and hydraulic study for Jata Ganga river at Jageshwar dham **Study Group:** JP Patra, AK Lohani, Pankaj Mani, DS Bisht, SS Rawat **Duration:** 1 Year (July 2023 – July 2024) **Status:** Completed	Member suggested to consider possible impact of sediment during the flood. It was explained that sediment/mud flow is not modelled in this study. However, free board of about 2m has been suggested for modelling error, uncertainty etc.
	Sponsored Studies (Ongoing)	
1.	Flood Plain Zone Delineation of Burhiganga - a tributary of the Ganga River from Village Dabal in Dist. Muzaffarnagar to Garmukteshwar **PI: Er. J. P. Patra**	Member enquired about effects of river morphology/ river bank changes. It is informed that in this study as per the requirement of sponsoring agency present river course is considered and the river alignment, cross-section are provided as per prevailing condition. It is also informed that the historical flood inundation extent (2009-2023) will also be considered.
	Internal Studies (Ongoing)	
1.	Flood Forecasting under Changing Climate Conditions - Role of Machine Learning and Conceptual/Physical based Model **PI: Dr. P. C. Nayak**	PI explained the objective specific outcomes from the study and stressed the supremacy of the Transformer-based ML tool in flood forecasting. No specific action was suggested.
2.	Entropy and Image Processing Based Non-Contact Discharge Monitoring Techniques: Testing and Implementation for Indian rivers **PI: Dr. R. V. Kale**	PI presented the outcome of field investigations for installation of the automatic water level and surface velocity radars at selected five G&D sites on Krishna and Godavari River basin and objective-wise achievements. Dr. Sandeep Goyal, a Working Group member, enquired about the applicability of radar-based techniques under turbulent flow conditions, such as those found in Himalayan river reaches. The Principal Investigator (PI) responded that these techniques are currently in the testing phase, and a detailed assessment is required before any definitive conclusions can be provided. Other queries and questions related to the methodologies were also addressed and explained.

S. No.	Title of Project/Study	Recommendations/Suggestions
		As the AWLR and SVRs will be installed at the selected five sites during May & June 2025, therefore, the extension of one year is requested which is approved by the committee. There were no specific comments from the members regarding the study.
3.	A Flood Forecasting Framework Coupling a High Resolution WRF Ensemble with 2D Hydrodynamics Model for Himalayan Mountainous Area. **PI: Dr. R. V. Kale**	PI presented the study objective wise achieved results and analysis. No specific action was suggested.
4.	Basin-scale, integrated water resources assessment through integrated hydrological modelling **PI: Dr. S. Sahoo**	PI mentioned the timely advancement of the project. He explained the work related to setting up the Soil and Water Assessment Tool (SWAT) hydrologic model and the results. The query about the data sources was answered. It was suggested that the accuracy of the DEM used be checked.
5.	Web based platform for IDF Design Rainfall Estimates for India **PI: Sh. Sukant Jain**	PI demonstrated the Beta version of app displaying the IDF curve of whole India and PMP and SPS values from PMP atlas for Ganga Basin. Also, the result on Best-fit probability distributions were presented. No specific action was suggested.
Internal studies (New)		
1.	Application of Annual Flow Duration Curves (AFDC) in Flood Flow and Low Flow Frequency Analysis **PI: Dr. Sanjay Kumar**	PI presented the new study, its objectives and application of AFDC in flood and low flows frequency analysis. Members suggested to use IHA software for low flow analysis. Other queries and questions from members were explained and answered.
2.	Development of Web-based Baseflow Separation Analysis Tool **PI: Dr. R. V. Kale**	PI of the study presented the background, objectives and the methodology of the proposed new study. No specific action was suggested.
3.	Development of Integrated Flood Analysis and Mapping System (I-FAMS) for India **PI: Dr. R. V. Kale**	The PI presented the proposal, objectives and deliverables on I-FAMS. No specific action was suggested.
4.	An Integrated approach for Irrigation Scheduling in a Command area **PI: Dr. L. N. Thakural**	PI presented the background, objectives and the methodology to be. It was also informed that this project (2025 to 2028) will be executed through the internal funds.
5.	Evaluating Rain-on-Grid Hydraulic Modelling for Dam Break Analysis: A Comparative Study of HEC-RAS and TUFLOW in Indian Catchments **PI: Sh. Sukant Jain**	The PI presented the proposal, objectives and deliverables on. No specific action was suggested.
6.	Web-Based Flood Hydrograph Estimation Tool for Hydraulic Structure Design in India **PI: Sh. Sukant Jain**	The PI presented the proposal, objectives and deliverables on. No specific action was suggested.

Recommended Work Programme of SWHD for the Year 2025-26

S. No.	Title of Project/Study	Study Team	Duration	Funding
Internal studies (Ongoing)				
1.	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 - June 2025)	NIH
2.	Entropy and Image Processing Based Non-Contact Discharge Monitoring Techniques: Testing and Implementation for Indian rivers	**NIH: R V Kale** M K Goel A K Lohani **CWC: CE, KGBO, CWC** **External Expert: Prof. M. Perumal**	1.5 Years (April 2024 to Sept. 2025)	NIH
3.	A Flood Forecasting Framework Coupling a High Resolution WRF Ensemble with 2D Hydrodynamics Model for Himalayan Mountainous Area.	**R V Kale** K Sharma S Kumar A K Lohani	3 Year (April 2024 to March 2027)	NIH
4.	Basin-scale, integrated water resources assessment through integrated hydrological modelling	**S Sahoo** A K Lohani P C Nayak R V Kale J P Patra	2.5 Years (April 2024 to Sept. 2026)	NIH
5.	Web based platform for IDF Design Rainfall Estimates for India	**Sukant Jain** A K Lohani J P Patra Richa Pandey Chandra Prakash	1.5 Years (April 2024 to Sept 2025)	NIH
Sponsored Studies (Ongoing)				
1.	Flood Plain Zone Delineation of Burhiganga a tributary of the Ganga River from Village Dabal in Dist. Muzaffarnagar to Garmukteshwar	**J P Patra** A K Lohani P C Nayak Sanjay Kumar S Sahoo	6 Months (Jan 2025 to Jun 2025)	Irrigation and WRD, Govt. of UP
Internal studies (New)				
1.	Application of Annual Flow Duration Curves (AFDC) in Flood Flow and Low Flow Frequency Analysis	**Sanjay Kumar** J P Patra R V Kale L N Thakural Soumyaranjan Sahoo	2 Years (April 2025 to March 2027)	NIH
2.	Development of Web-based Baseflow Separation Analysis Tool	**R V Kale** Sanjay Kumar A K Lohani M K Goel	2 Years (April 2025 to March 2027)	NIH
3.	Development of Integrated Flood Analysis and Mapping System (I-FAMS) for India	**R V Kale** A K Lohani M K Goel J P Patra P C Nayak	2 Years (April 2025 to March 2027)	NIH
4.	An Integrated approach for Irrigation Scheduling in a Command area	**L N Thakural** Sukant Jain S K Gupta Richa Pandey	3 Years (April 2025 to March 2028)	NIH

S. No.	Title of Project/Study	Study Team	Duration	Funding
		Sanjay Kumar Gaurav Kumar		
5.	Evaluating Rain-on-Grid Hydraulic Modelling for Dam Break Analysis: A Comparative Study of HEC-RAS and TUFLOW in Indian Catchments	**Sukant Jain** Chandra Prakash A K Lohani	2.5 Years (April 2025 to Sept 2027)	NIH
6.	Web-Based Flood Hydrograph Estimation Tool for Hydraulic Structure Design in India	**Sukant Jain** A K Lohani	1.5 Years (April 2025 to Sept 2026)	NIH

Water Resources Systems Division

Dr. A. R. Senthil Kumar, Sc. G and Head, presented an overview of the Water Resources Systems Division (WRSD) – work force, vision and missions, major research outputs, research and training facilities, the ongoing and new sponsored and internal studies, training courses and outreach activities organized and upcoming training calendar. Following this, the division's scientists were invited to present the completed studies, the progress of ongoing internal studies, and the proposed new studies. The comments and suggestions provided by the Working Group members are summarized below.

Progress of Work Program for the Year 2024-25

S. No.	Title	Recommendations/ Suggestions
	Sponsored/ Internal Studies (Completed)	
1.	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. **Study Group:** Dr. P K Mishra; Dr. P K Singh **Duration:** 2 years (04/21-06/23) extended up to 03/24 **Status:** Completed	Dr. P. K. Mishra presented the study and no specific comments/suggestions were received.
2.	Spatio-temporal Water Availability under Changing Climate and Land-use Scenarios in Wainganga River Basin **Study Group:** Dr. M. K. Nema; Dr. P. K. Mishra **Duration:** 3 years (04/22-03/25) **Status:** Completed	Dr. M. K. Nema presented the study and no specific comments/suggestions were received.
3.	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 **Study Group:** Dr. M. K. Nema; Dr. P. K. Mishra; Dr. Praveen Thakur (IIRS); Dr. P. R. Patil **Duration:** 3 years (04/22-03/25) **Status:** Completed	This study was briefly described.
	Sponsored/ Internal Studies (Ongoing)	
1.	Simulation of operation of multiple reservoirs in Wainganga Basin for conservation and flood control under changing climate scenario **PI: Dr. A. R. Senthil Kumar**	Dr. A. R. Senthil Kumar presented the progress of the study and no specific comments/suggestions were received.
2.	ResSed – Tool development for prediction of elevation-area-capacity curves of the reservoirs **PI: Dr. A. R. Senthil Kumar**	Dr. A. R. Senthil Kumar presented the progress of the study as well as tool development and no specific comments/suggestions were received.
3.	Integrated operation of Bisalpur and Isarda reservoirs in Banas river basin, Rajasthan **PI: Dr. Archana Sarkar**	Dr. Archana Sarkar presented the progress of the study. The Chairman of the WG has suggested to work out the effect of field derived/insitu soil properties in comparison to the literature based soil properties on model (SWAT) response.
4.	Water and Land Productivity Accounts for the major river basins of India using water accounting plus for sustaining water and food security: WAPRO-India	Dr. P. K. Mishra presented the progress of the study and no specific comments/suggestions were received.

S. No.	Title	Recommendations/ Suggestions
	PI: Dr. P. K. Mishra	
5.	Development of rule-based integrated operation framework for the Mahanadi basin **PI: Dr. P. K. Mishra**	Dr. P. K. Mishra presented the progress of the study and no specific comments/suggestions were received.
6.	Assessment of Precipitation Gradients and Temperature Lapse Rates for Hydrological Modelling in a Himalayan Catchment **PI: Dr. P. R. Patil**	Dr. P. R. Patil presented the progress of the study and no specific comments/suggestions were received.
7.	Evaluation of Area-Design Curve to estimate sediment distribution in Indian reservoirs **PI: Dr. U. K. Singh**	Dr. U. K. Singh presented the progress of the study and no specific comments/suggestions were received.
8.	Water yield potential and flood risk assessment under changing climate and land use in the Teesta River basin up to Domohani **PI: Sh. Harsh Upadhyay**	Dr. Harsh Upadhyay presented the progress of the study and no specific comments/suggestions were received.
9.	Water resources planning and management using DSS (PM) under changing climatic and land-use conditions **PI: Dr. Richa Pandey**	Dr. Richa presented the progress of the study. The WG member, Dr Sudhindra Sharma recommended addition of groundwater component in the study.
Sponsored/ Internal Studies (New)		
1.	Hydrological Investigation and Climatic Trend Analysis of a Lesser Himalayan Forested Catchment **PI: Dr. P R Patil**	This study was briefly described.
2.	Comprehensive Reservoir Sedimentation Analysis of Major Indian Reservoirs Using Google Earth Engine **PI: Dr. A. Ahirwar**	Dr. A. Ahirwar proposed the study. Dr. A K Lohani, mentioned that similar kind of study is being carried out in the institute. The Chairman of the WG has suggested to consult with the concerned PI & Co-PI of the study. After discussion with the PI & Co-PI, it has been decided that this study will be proposed again based on the outcome of the ongoing study mentioned by Dr. A K Lohani.
3.	Application of Decision Support System for Planning & Management (DSS (PM)) in the Yamuna River Basin **PI: Dr. A. Ahirwar**	Dr. A. Ahirwar proposed the study. The WG member, Dr. Bhishm Kumar, Dr. A K Lohani suggested to modify the objective of study. As per the suggestion of the Chairman of the WG, the study area has been changed from Narmada to Yamuna River Basin.
4.	Development of Water Security Plans for Uttarakhand Under Changing Land Use and Climatic Scenarios **PI: Dr. Manish K. Nema**	Dr. M. K. Nema presented the proposed new study. WG members suggested to include Dr. SS Rawat, Sci.-F in study team. They indicated to take inputs from various state/central agencies such as IRI, USAC, UCOST, Uttarakhand Jal Sansthan, IIRS, etc. for accommodating and addressing their current water related issues on the study domain. Suggested to modified the title (It has been done).
5.	ET-based Irrigation Performance Assessment of a Command Area **PI: Sh. Harsh Upadhyay**	Dr. Harsh Upadhyay proposed the study and no specific comments/suggestions were received.

Recommended Work Programme of WRSD for the Year 2025-26

S. No.	Title	Study Team	Duration	Funding
Ongoing Sponsored/ Internal Studies				
1.	Simulation of operation of multiple reservoirs in Wainganga Basin for conservation and flood control under changing climate scenario	**A R Senthil Kumar** T Thomas M K Nema Harsh Upadhyay Sunil Gurrapu	3 years (04/24-03/27)	NIH
2.	ResSed – Tool development for prediction of elevation-area-capacity curves of the reservoirs	**A R Senthil Kumar** U K Singh P K Singh Harsh Upadhyay Nitesh Patidar	2 years (04/24-03/26)	NIH
3.	Integrated operation of Bisalpur and Isarda reservoirs in Banas river basin, Rajasthan	**Archana Sarkar** A R Senthil Kumar P K Mishra Harsh Upadhyay Sanjay Agarwal	3 years (04/24-03/27)	NIH
4.	Water and Land Productivity Accounts for the major river basins of India using water accounting plus for sustaining water and food security: WAPRO-India	**P K Mishra** Vishal Singh Harsh Upadhyay P R Patil A. R. Senthil Kumar	2 years (04/24-03/26)	NIH
5.	Development of rule-based integrated operation framework for the Mahanadi basin	**P K Mishra** M K Goel P K Singh A R Senthil Kumar	1.5 years (04/24-09/25)	NIH
6.	Assessment of Precipitation Gradients and Temperature Lapse Rates for Hydrological Modelling in a Himalayan Catchment	**P R Patil** M K Nema P K Mishra A R Senthil Kumar	3 years (04/24-03/27)	NIH
7.	Evaluation of Area-Design Curve to estimate sediment distribution in Indian reservoirs	**Umesh K Singh** A R Senthil Kumar M K Goel P R Patil Harsh Upadhyay	2 years (04/24-03/26)	NIH
8.	Water yield potential and flash flood risk assessment under changing climate and land use and strengthening of existing instrumentation in the Teesta River basin up to Domohani	**Harsh Upadhyay** P K Singh A R Senthil Kumar P R Patil	3 years (04/24-03/27)	NIH
9.	Water resources planning and management using DSS (PM) under changing climatic and land-use conditions	**Richa Pandey** Ajay Ahirwar Sukant Jain A R Senthil Kumar A K Lohani	2 years (04/24-03/26)	NIH
New Sponsored/ Internal Studies				
1.	Hydrological Investigation and Climatic Trend Analysis of a Lesser Himalayan Forested Catchment	**P R Patil** M K Nema P K Mishra S S Rawat D S Meena (IFS) P Tomar (IFS) J Dagade (IFS)	10 months (05/25-03/26)	UKFD

S. No.	Title	Study Team	Duration	Funding
2.	Comprehensive Reservoir Sedimentation Analysis of Major Indian Reservoirs Using Google Earth Engine	**Ajay Ahirwar** R Pandey U K Singh A R Senthil Kumar	3 years (04/25 – 03/28)	NIH
3.	Application of Decision Support System for Planning & Management (DSS (PM)) in the Narmada River Basin	**Ajay Ahirwar** Harsh Upadhyay R Pandey A R Senthil Kumar	3 years (04/25 – 03/28)	NIH
4.	Development of Water Security Plans for Uttarakhand Under Changing Land Use and Climatic Scenarios	**Manish K Nema** Vishal Singh Himanshu Joshi (GBPNIHE, Almora)	3 years (05/25 – 03/28)	NIH
5.	ET-based Irrigation Performance Assessment of a Command Area	**Harsh Upadhyay** Sukant Jain Richa Pandey A R Senthil Kumar P R Patil	2 years (05/25 – 04/27)	NIH

In the end, the Member-Secretary thanked all the members for their valuable contributions during deliberations in the Working Group meeting. The meeting ended with vote of thanks to the Chair.

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Annexure - I

List of Working Group members who attended the 55th WG meeting

1.	Dr. M. K. Goel, Director, NIH	Chairman
2.	Dr. Bhishm Kumar, IAEA Consultant, Roorkee	Member
3.	Sh. Sudhindra Mohan Sharma, Ex-Nodal Officer, MoDWS, Indore	Member
4.	Dr. Praveen Thakur, IIRS, Dehradun (Online)	Member
5.	Dr. (Mrs.) Sadhana Malhotra, Mindspace, Dehradun	Member
6.	Dr. S.S. Grewal, (Retd.), Chandigarh	Member
7.	Dr. Ramakar Jha, Professor, NIT Patna	Member
8.	Dr. R. K. Singh, ICAR-IISWC, Dehradun	Member
9.	Dr. A.K. Lohani, Sc. G & Head, SWH Division, NIH	Member
10.	Dr. Y.R.S. Rao, Sc. G & Head, EH Division, NIH	Member
11.	Dr. Suhas Khobragade, Sc. G & Head, HI Division, NIH	Member
12.	Dr. A. R. Senthil Kumar, Sc. G & Head, WRS Division, NIH	Member
13.	Dr. Anupma Sharma, Sc. G & Head, GH Division, NIH	Member
14.	Dr. Surjeet Singh, Sc. G & Head, C4S, NIH	Member
15.	Dr. Sanjay Kumar, Sc. F & Head, Technical Cell, NIH	Member-Secretary
16.	Prof. A. A. Kazmi, IIT-Roorkee	Invitee-Member

Scientists of NIH:

	C4S Division		**HI Division**
1.	Dr. Soban Singh Rawat, Sc. F	28.	Dr. M S Rao, Sc. G
2.	Dr.(Smt) Ashwini A. Ranade, Sc. D	29.	Dr. Gopal Krishan, Sc. E
3.	Dr. Sunil Gurrapu, Sc. D	30.	Dr. Santosh M. Pingale, Sc. D
4.	Dr. Vishal Singh, Sc. D	31.	Dr. Tripti Muguli, Sc. D
5.	Dr. Lavkush Kumar Patel, Sc. D	32.	Sri. Rajeev Gupta, Sc. B
6.	Dr. Kapil Kesarwani, Sc. D	33.	Sri. Ruchir Patidar, Sc. B
7.	Dr. Deepak Singh Bisht, Sc. C	34.	Sri V K Agarwal, Sc. B
8.	Dr. Akshaya Verma, Sc. C	35.	Dr. Amit Pandey, Sc. B
9.	Dr. Kuldeep Sharma, Sc. C		**SWH Division**
10.	Sri. Rajat Kumar, Sc. B	36.	Dr. P C Nayak, Sc. F
11.	Sri. Jatin Malhotra, Sc. B	37.	Dr. Ravindra Vitthal Kale, Sc. E
	EH Division	38.	Dr. R.V. Kale, Sc. E
12.	Dr. M K Sharma, Sc. F	39.	Dr. L.N. Thakural, Sc. E
13.	Dr. Rajesh Singh, Sc. E	40.	Er. J.P. Patra, Sc. E
14.	Dr. Pradeep Kumar, Sc. E	41.	Er. Sukant Jain, Sc. C
15.	Dr. Vinay Kumar Tyagi, Sc. D	42.	Dr. Soumyaranjan Sahoo, Sc. B
16.	Dr. Prasanta Kumar Sahoo, Sc. D		**WRS Division**
17.	Dr. Kalzang Chhoden, Sc. C	43.	Dr. Archana Sarkar, Sc. F
18.	Dr. Shakti Suryavanshi, Sc. C	44.	Dr. Manish K. Nema, Sc. E
19.	Dr. Shailendra Kumar Kumre, Sc. B	45.	Dr. P K Mishra, Sc. D
20.	Ms. Poonam, Sc. B	46.	Dr. Pravin Rangrao Patil, Sc. C
	GH Division	47.	Dr. Umesh Kumar Singh, Sc. C
21.	Dr. Sumant Kumar, Sc. E	48.	Dr. Ajay Ahirwar, Sc. C
22.	Dr. Lagudu Surinaidu, Sc. D	49.	Dr. Richa Pandey, Sc. B
23.	Dr. Nitesh Patidar, Sc. C	50.	Sri. Harsh Upadhyay, Sc. B
24.	Dr. Ajit Kumar Behera, Sc. C		**Technical Cell**
25.	Dr. Sushindra K. Gupta, Sc. C	51.	Sri. Rajesh Agarwal, Sc. B
26.	Dr. Satendra Kumar, Sc. B		
27.	Sri. Pintu Kumar Gupta, Sc. B		

In addition, Scientific/Technical Staff also participated during presentations of their respective Divisions.

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