सत्यमेव जयते

International Water Conclave
SHILLONG 2024

GOVERNMENT OF MEGHALAYA

To share and care for water issues in the hilly areas collectively

REPORT

9th - 10th February, 2024
Shillong, Meghalaya.

Introduction

To share and care for water issues in the hilly areas collectively.

The International Water Conclave, 2024, organised by the Government of Meghalaya in collaboration with the Ministry of Jal Shakti, Government of India, and supported by various partner agencies, brought together policymakers, experts, researchers, and stakeholders to address critical water-related issues. This significant gathering aimed to explore innovative solutions and foster partnerships for sustainable water management amidst growing global water scarcity and the impacts of climate change.

The Conclave is a 360 degree initiative that seeks to initiate a deeper discourse on water across the global community and provide a platform for critical, honest and in depth assessment of the sector, identify global best practices and enable alignment of local actions for meaningful global impact. Therefore, while the conclave works to protect and preserve water resources in the global battle against climate change, it simultaneously aims at empowering the community, particularly farmers, the fish rearing communities, vulnerable groups and more, by placing them at the forefront of global actions.

Through productive discussions and knowledge exchange, participants collaborated to advance cooperation and accelerate progress towards achieving the United Nations' Sustainable Development Goals related to water. The conclave concluded with a resounding call to action, underscoring the imperative for coordinated action at local, national, and international levels to effectively address water challenges, safeguard precious water resources, and bolster resilience in the face of evolving environmental pressures.

Message

In the verdant northeast, Meghalaya boasts abundant water resources, from cascading waterfalls to meandering rivers. Yet, preserving these resources is crucial in the face of climate change, urbanization, and unsustainable practices.

I am proud to announce that, with the backing of the Ministry of Jal Shakti, Government of India, Meghalaya hosted the International Water Conclave 2024 in Shillong. This pivotal event brought together experts, policymakers, researchers, and stakeholders worldwide to tackle pressing water-related challenges.

Representatives from Bhutan, Cambodia, Myanmar, Nepal, and Thailand, alongside international organizations like the Asian Development Bank, Indo Japan Business Council, and GIZ, graced the conclave. State Governments of Arunachal Pradesh, Assam, Himachal Pradesh, Kerala, Mizoram, Nagaland, and Sikkim also lent their support.

Under the theme "Water, Hill Lives, and Future," the conclave emphasized participatory planning, source protection, and water security. Discussions ranged from water governance to community involvement, technological solutions, and climate resilience.

This publication encapsulating the rich discourse of the conclave serves as a repository of knowledge and a guiding beacon for policymakers and practitioners in the field of water management. It highlights various topics such as water governance, community participation, technological interventions, and climate resilience.

The conclave served as a global platform for discourse on water management, conservation, and sustainable utilization, fostering innovative ideas and collaborative efforts to address water challenges.

My heartfelt thanks to all organizers, participants, and supporters. Let us collectively strive for a future where everyone has access to clean, sustainable water resources, ensuring prosperity and well-being for all.

Conrad K. Sangma

Chief Minister of Meghalaya

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GOVERNMENT OF MEGHALAYA

DAY 01

9th February, 2024

INAUGURAL SESSION

The session set the tone for the entire conclave, encompassing key messages and pointers delivered by dignitaries from various states, particularly from the northeastern regions, as well as experts from national levels, including representatives from the Government of India.

Welcome address by Dr. Joram Beda, IAS, Commissioner & Secretary, Govt. of Meghalaya

In his welcome address, Dr. Joram Beda informed that the world is presently grappling with the pressing issues of global warming and climate change, prompting concerted actions from nations worldwide. He underscored the critical nature of the current period, emphasising that the global community is confronted with myriad challenges with significant transformations anticipated in the foreseeable future. Dr. Beda underscored Meghalaya's longstanding commitment to sustainability, highlighting various sustainable initiatives undertaken through different departments, including spring shed management, watershed management, Sloping Agriculture Land Technology (SALT), afforestation, among others.

Dr. Beda extended a warm welcome to all participants, expressing hope that the conclave would engender fruitful deliberations and yield enduring benefits for every state and country involved.

Theme setting by Dr. P. Shakil Ahammed, IAS, Additional Chief Secretary, Govt. of Meghalaya

Addressing the multifaceted challenges of water management, Dr. P. Shakil Ahammed emphasised the importance of recognizing the inherent differences between hilly terrains and plains. Given the geological intricacies, focused attention on hill areas is crucial. He expressed his concern that despite water being the lifeblood of the nation, 256 out of 746 districts face water scarcity, necessitating a shift towards water efficiency rather than mere sufficiency.

Highlighting the alarming loss of water, estimated at 60% in some studies, he said that it underscores the urgent need for enhanced storage capacities. It is crucial to safeguard springs and forests as natural reservoirs to mitigate these losses. In all this, he feels that collaboration is key to overcoming these challenges, requiring collective efforts and minimal water usage.

Despite being one of the wettest places on the planet, Meghalaya faces a paradoxical thirst for water, emphasising the necessity for community-driven initiatives to protect catchment areas. So, Dr. Ahammed said that adopting the 5Ps of water management – Political will, Public financing, Partnerships, Public Participation, and Persuasion for sustainability and the 4Es of Water Governance – Ecology, Equity, Efficiency and Economics– is crucial in orchestrating a cohesive strategy.

Dr. Ahammed also maintained that public-private partnerships are indispensable, requiring proactive measures to address loopholes in the system and the shortage of trained manpower in the water sector. Emphasising the role of society, industry, and systemic efficiency akin to energy conservation, he concluded that a concerted effort towards a comprehensive declaration is essential for sustainable water management practices

Address by Smti. Debashree Mukherjee, IAS, Secretary, Ministry of Jal Shakti, Govt of India

Smt. Debashree Mukherjee emphasised on the pivotal role of state-level initiatives in advancing water management in the face of climate change challenges, as exemplified by events such as the concurrent droughts and floods experienced in 2023. She maintained that the imperative for states to collaborate, establish objectives, and offer financial and technical assistance to collectively address these pressing issues. Recent endeavours, such as the Water Ministers Conference, facilitated the discussions on best practices and shortcomings, culminating in 23 recommendations consolidated into five key areas of focus.

Smt. Mukherjee said that the pursuit of water security necessitates addressing climate-induced challenges in storage infrastructure, notably through the implementation of the Dam Safety Act, albeit requiring further enhancements. Endeavours have also been extended to groundwater management and the preservation of springs, with Meghalaya at the forefront of pioneering initiatives like comprehensive water census and spring mapping. She further added that key priorities include augmenting water use efficiency, particularly in agriculture, and fostering river health through flood management and rejuvenation endeavours.

She also pointed out that Cross-cutting themes such as governance and community participation underscore the collective responsibility in water management, with Meghalaya serving as a model with its proactive water policy. Collaboration among states sharing river basins is imperative for optimising water utilisation, mandating the establishment of supportive institutions and platforms. She concluded that learning from shared experiences is paramount, facilitated by technical assistance from the Government of India, ultimately ensuring concerted efforts towards sustainable water management practices.

Address by Shri. Comingone Ymbon, Hon'ble Water Resource Minister, Govt. of Meghalaya

Shri. Comingone Ymbon expressed gratitude to the Hon'ble Chief Minister for his invaluable guidance and support in addressing the critical issue of water management. He also appreciated Dr. Ampareen Lyngdoh, Hon'ble Minister for her dedication and contributions. Shri. Ymbon emphasised the urgency of prioritising safeguards for precious water resources due to water scarcity. Recognizing water's significance as life's essence, he acknowledged his responsibilities as a minister entrusted with this crucial task. He also highlighted Meghalaya's commitment to sustainable water management practices and sufficiency, alongside the importance of ecosystem preservation and commended the diligent efforts of the Government of Meghalaya officers, whose hard work contributed to the conclave's success.

International Water Conclave Shillong 2024

Address by Shri. Conrad Sangma, Hon'ble Chief Minister of Meghalaya

The Hon'ble Chief Minister of Meghalaya, Shri. Conrad K Sangma, during his speech, stressed on the crucial importance of water resource management during the gathering to address pressing issues. He began by highlighting the role of the irrigation department that extends beyond mere infrastructure projects, urging a broader perspective to encompass the department's true objectives. The Chief Minister acknowledged that despite significant financial investments in water-related schemes, their effectiveness often gets obscured amidst governance complexities.

Recognizing the interconnected nature of water issues across geographical boundaries, the need for multilateral cooperation among states and countries was emphasised. With climate change worsening these challenges, he said that there was a call to address water-related issues across various scales, from local to regional platforms. The Chief Minister stressed on the impact of water scarcity on agriculture and other sectors, emphasising the urgency to mitigate and adapt to these evolving challenges. While Meghalaya's proactive approach in formulating water policies and implementing initiatives such as spring rejuvenation and village-level water committees was acknowledged, it was also recognized that comprehensive solutions require collaborative efforts across departments and sectors.

Challenges like water connectivity in urban areas and the necessity for holistic approaches were also addressed, with an emphasis on balancing development activities like mining with environmental conservation. Thus, the Chief Minister concluded his speech by saying that the conclave was deemed pivotal in fostering interdepartmental collaboration and charting a collective path forward, with government agencies closely collaborating with organisations like NESAC to leverage data-driven insights for informed decision-making and sustainable water management.

*Scan the **QR Code** to watch the live video of the **Inaugural Plenary Session***

TECHNICAL SESSION

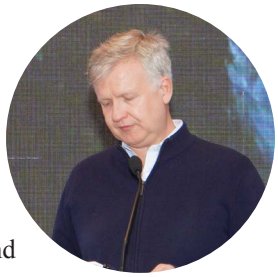
Best Practices on Water Conservation

The session shed light on a multitude of initiatives and experiences from Meghalaya, the North-Eastern Region, various hill regions of India, and neighbouring countries that propelled water sustainability and security forward. These insights held particular relevance and provided valuable lessons for hill regions.

Moderator:

Shri. Eklavya Prasad, Managing Trustee, Megh Pyne Abhiyan, Patna

Shri. Eklavya Prasad opened the platform of discussion by acknowledging the privilege of convening with esteemed minds and passionate advocates for the crucial cause of water conservation and management. He emphasised that water, being the essence of life, transcends geographical boundaries and sustains humanity. Shri. Prasad stressed the importance of collaboration in achieving true progress, highlighting the necessity to bridge divides and transcend barriers. He urged all participants to work hand in hand towards a future where every drop of water is treasured and safeguarded. In conclusion, Shri. Prasad emphasised the collective responsibility to act as catalysts for change.



Shri. Lance Gore Principal Water Resources Specialist, ADB

Shri. Lance Gore, Principal Water Resources Specialist at the Asian Development Bank HQ, emphasised the foundational role of water conservation across various developmental sectors, including water and food security, climate resilience, ecological preservation, economic prosperity, and livelihood improvement. He elucidated that water conservation stands as a fundamental component, crucial for ensuring sustainable development and effective resource management. The successful implementation of Integrated Water Resources Management (IWRM), he noted, heavily depends on robust governance mechanisms encompassing policies, regulations, government and non-governmental institutions, river basin management, water resource allocation, and sustainable land use planning.

Shri. Gore highlighted the pivotal role of the Asian Development Bank (ADB) in supporting governments across regions such as Karnataka, Bhutan, and Nepal in enhancing their water sources. Notably, in Karnataka, the Advanced Centre in IWRM has been actively involved in drafting the Water Policy 2022, formulating basin plans, and conducting comprehensive IWRM training programs. On the supply side, ADB prioritises infrastructure development, including the construction of dams, canals, and water management systems aimed at optimising water storage capacities. Furthermore, concerted efforts are directed towards implementing recharge systems to replenish groundwater reserves, thereby ensuring long-term sustainability.

Through continuous elaboration and modification of strategies, Shri. Gore articulated that ADB aims to address evolving challenges and opportunities in water conservation, thus contributing significantly to the broader objectives of sustainable development and environmental stewardship.

Shri. Thach Sovanna, Director, Ministry of Water Resources and Meteorology (MOWAM), Cambodia

Shri. Thach Sovanna pointed out that Cambodia is situated in Southeast Asia, and features a warm climate. With a population of approximately 15 million as of the 2019 general population census, Cambodia experiences two primary seasons: the Wet Season, extending from May to October, and the Dry Season, spanning from April to November. Over a period of 37 years from 1981 to 2017, the country has observed higher precipitation levels in upland areas compared to lowland regions. The direction of water flow undergoes changes during the Dry and Wet seasons, flowing from the Lazax to Megong in the former and vice versa in the latter. Shri. Sovanna also pointed out that climate change poses significant challenges to this hydrological pattern causing flood and drought in some parts of the country.

He mentioned that drought poses a significant challenge in certain areas of Cambodia during the rainy season, with some effects extending into the dry season. Insufficient rainwater storage or absorption exacerbates this issue during the dry season. This results in hardships that include reduced access to safe drinking water

and threats to food security due to insufficient water for agricultural and fishing activities. To mitigate these challenges and ensure protection from water-related natural hazards, the Ministry of Water Resources and Meteorology (MOWRAM) has developed the following action plans: firstly, to conduct studies and undertake rehabilitation and construction of flood protection embankments and drainage systems; secondly, to implement immediate response measures such as pump and heavy equipment interventions in areas affected by drought, flood, and other water-related hazards; and thirdly, to actively engage and promote participatory involvement of individuals and institutions at all levels in flood mitigation measures and drought interventions. Shri. Sovanna added that Cambodia has established a national river basin management system to address flood and drought concerns. He further said that efforts to mitigate these challenges include augmenting weather and flood forecasting capabilities, establishing immediate response mechanisms, and collaborating with the Mekong River Commission (MRC) to strengthen flood mitigation strategies.

Shri. Susheel Chandra Acharya, Joint Secretary, Ministry of Energy, Water Resources and Irrigation, Nepal

Shri. Susheel C. Acharya underscored Nepal's considerable abundance of water resources, boasting an annual discharge of 25 billion cubic litres for a population of 30 million. However, despite this apparent surplus, he said that the main challenge lies in effectively aligning water availability with demand, particularly in terms of location and timing. Nepal experiences heavy rainfall concentrated within a four-month period, leaving the remainder of the year relatively dry, thereby exacerbating water scarcity issues in specific regions and times. Furthermore, the distribution of water resources presents challenges, as Himalayan water primarily flows deep within river valleys, leaving high terrains devoid of adequate water supply.

Shri. Acharya also emphasised on Nepal's significant exposure to climate risks, ranking as the 10th most affected country globally according to the climate risk index. It stands as the fourth most vulnerable country to climate change, particularly susceptible to floods, earthquakes, and landslides. These natural hazards pose considerable threats to both human populations and the environment, thereby negatively impacting development prospects.

In addressing water conservation, he outlined various initiatives and practices underway across Nepal. These encompass the management of stone spouts in the Kathmandu Valley, conservation efforts targeting spring sources in hilly terrains, terrace rice cultivation practices and the construction of small to medium storage facilities. Additionally, conservation measures extend to riverbank preservation, community-led initiatives for watershed conservation through forestry development and the establishment of protected areas such as national parks. He further added that community engagement emerges as a pivotal aspect of water management, encompassing activities like desilting irrigation canals and mobilising efforts for grassroots water conservation endeavours. Through these collaborative endeavours, Nepal endeavours to mitigate the impacts of water scarcity and ensure the sustainable management of its water resources for the benefit of its populace and the environment.

Shri. Nizamudeen A, IAS, Mission Director, MGNREGS, Kerala

Shri. Nizamudeen A, in his presentation, highlighted that the guiding principle for success in the water integration project is encapsulated in the mantra "To collect water," underscoring a people-centric approach characterised by collaborative efforts among various departments and institutions. This initiative serves as a model of convergence, with a focus on achieving maximum results with minimal resources while establishing a comprehensive database. He said that convergence plays a pivotal role by bringing together government departments, non-governmental organisations (NGOs), public participation and students to collectively work towards a common goal.

Spearheaded by Honourable MLA, I B Sathish MLA Kattakkada Constituency, Kerala, the project aims to attain water sufficiency in his constituency through the adoption of innovative solutions and modern technology, prioritising safety and sustainability. He maintained that despite commencing without initial funding, the project has garnered recognition as the most exemplary convergence effort in the state, meriting special mention at the Geneva Conference. Noteworthy achievements include a daily groundwater recharge of 16 lakhs, the establishment of farm ponds, and the initiation of inland fisheries in six ponds. The integration of technology remains a critical aspect for ensuring the continued success and effectiveness of the project.

Shri. Joginder Singh Chauhan, Director cum Chief Engineer, SWSM, Himachal Pradesh

Shri. Joginder Singh Chauhan, highlighted innovative initiatives underway in Himachal Pradesh aimed at revolutionising the provision of drinking water supply. A significant transformation involves transitioning from conventional water distribution systems to automated ones, enhancing efficiency and reliability. He mentioned that this shift eliminates manual operations, leading to the modification of traditional bowris into pollution-free mechanised versions through collaboration with Panchayati Raj Institutions (PRIs). These mechanised bowris offer easy operation and are human-touch-free, ensuring improved sanitation standards. Furthermore, Shri. Chauhan said that the introduction of IoT sensor-based rural smart water management systems enables real-time monitoring and optimization of water usage. Submersible pumps are utilised for high head surface sources, incorporating automation to conserve energy, manpower, and capital costs. With no need for a pump house, installation within a pipe facilitates submergence, while automation safeguards against dry runs and voltage fluctuations, thereby extending pump life. Additionally, traditional dug wells are being transformed into solar-powered automated tubular wells, and solar-powered pumping systems are being installed in improved dug wells and existing borewells. He added that these initiatives align with efforts for water harvesting and conservation, crucial for climate change mitigation in Himachal Pradesh. Proposed Detailed Project Reports (DPRs) not only aim to conserve snow and water but also provide irrigation to approximately 9242.84 hectares of land, emphasising sustainable water management practices.

Presentation by Dr. Joram Beda, IAS, Commissioner & Secretary, Govt. of Meghalaya

Dr. Joram Beda, while addressing the issue of water security, emphasised its critical importance from multiple perspectives. Firstly, from a health standpoint, ensuring water security is imperative due to the prevalence of water and food-borne diseases. Secondly, from a livelihood perspective, water is indispensable as it is essential for sustaining life, thereby necessitating the securing of our basic necessities. Additionally, water plays a vital role in productive economies as it is crucial for maintaining economic stability at both individual household and societal levels. Moreover, water is of utmost importance from an ecosystem perspective, as ecosystems rely entirely on water for their functioning and sustainability.

He also highlighted one of the major reasons why water security is an issue, noting that only 0.5% of fresh water is available for drinking, with 97% in the ocean, and 3% being fresh, out of which 2.5% is unavailable either locked in glaciers or underground. With the global population expected to reach 8.5 billion by 2030, the pressure on this limited freshwater supply is set to increase. Dr. Beda emphasised that water security hinges on ensuring the availability, access, and safe utilisation of water resources. Every state, including Meghalaya, faces the challenge of effectively managing its water resources. Despite receiving substantial rainfall, Meghalaya still grapples with water scarcity, particularly during lean seasons. Dr. Beda identified complacency as one of the primary threats to water security, which can arise when there is an apparent abundance of water.

He pointed out one of the many best practices in Meghalaya, which is the Spring shed Development. The mapping of 59,000 springs is in process, with 3,000 springs already mapped and 306 spring sheds constructed. The state has also dug 64,700 wells, constructed 560 gabion check dams, conducted tree plantation on 860 hectares of land, and created 12,765 percolation pits/dugouts. Meghalaya has proactively addressed this threat by implementing measures to increase water discharge and mapping and intervening in thousands of springs, which are vital water sources for the state.

Dr. Joram also discussed the Payment of Ecosystem Services (PES), stating that it is a unique practice in India where the government incentivizes farmers or landowners in exchange for managing their land to provide some ecological service. The total amount allocated is 14.14 crores, benefiting 388 communities and 503 individuals covering 642 villages. So far, 2,459 applications have been received, and about 60,000 households have benefited from this initiative. Dr. Joram emphasised that this is a smart investment by the government, targeting 830 crores to be received through carbon credits out of the initial 14 crores.

He further spoke about the Climate Adaptive Community-Based Water Harvesting project in Meghalaya, a collaboration between the government of Meghalaya and the Asian Development Bank. This 600 crore project, implemented by the Soil and Water Conservation Department, aims to construct thousands of water harvesting structures across Meghalaya to tap water and make it available during the lean season. The project is community-driven, with the project locations identified based on the interests of the people, and the department proceeds accordingly.

*Scan the **QR Code** to watch the live video of the **Technical Session** on Best Practices on Conservation of Water*

TECHNICAL SESSION

Water & Infrastructure Development

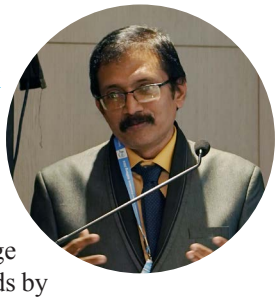
The session emphasised the necessity for infrastructure development in hill regions to consider the complex dynamics of water systems and climate variability. Participants stressed the importance of integrating ecological considerations with developmental goals and incorporating local knowledge into planning processes. Through collaborative dialogue, the session aimed to highlight strategies for sustainable infrastructure development that promotes water security and resilience in hill regions.

Moderator:

Shri. P.M. Scott, Member, RM, Central Water Authority, New Delhi

Shri P.M Scott, through his presentation on the "Role of Central Water Commission in Water Infrastructure Development" gave an insight into the roles and functions of CWC. He spoke about the issues and challenges in the management of water resources and the need for creation of water storage. He also talked about the main functions of CWC which is covering three main wings, such as, 'River Management Wing', 'Water Planning & Projects Wing' and 'Designs & Research Wing.' He further said that over the years, CWC have taken up several Dam Safety Management works and for 10 years, i.e, from 2021 to 2031, CWC has identified 776 dams for rehabilitation, out of which, 8 dams are in the North Eastern Region of India. CWC also works as the collector of data and this data can be used for infrastructure development, particularly for the North Eastern Region.. Shri. P. M. Scott further said that CWC also contributes through flood forecasting and shares the flood information with the neighbouring countries to keep the people away from flood. He added that CWC can also help the state governments in the formulation of the projects and the development of the irrigation sector and in maintaining clean rivers, care for environment and ecology. He concluded that CWC can also provide capacity building for water resources professionals.

Shri. Shajatnan K.H, Director (Technical), National Water Development Agency, New Delhi



While addressing the topic of "Water Sustainability and Inter-Basin Water Transfer," Shri. Shajatnan K.H. provided insights into the operations of the National Water Development Agency (NWDA) through the interlinking of rivers (ILR). He underscored ILR as an effective management technique for handling water resources, ecosystem conservation, and the development of essential water infrastructures such as dams, reservoirs, and storage systems. Additionally, he highlighted its role in mitigating the impacts of droughts and floods by managing ecosystem preservation, regulating river flows, and protecting aquatic habitats.

Furthermore, Shri. Shajatnan emphasised that the NWDA operates under the framework of the National Perspective Plan, which was devised in 1980. This plan aimed to address the need for providing storage and facilitating the transfer of surplus waters to water deficit regions. Notably, the NWDA was established as an autonomous organisation under the Ministry of Water Resources (now the Ministry of Jal Shakti) in July 1982 to effectively implement the goals outlined in the National Perspective Plan.

He elaborated on the necessity-driven nature of the Plan, particularly highlighting the need for Inter-Basin Water Transfer (IBW). This involved the development of 14 water transfer links in the Himalayan region, known as the Himalayan Component, and 16 water transfer links in Peninsular regions, termed the Peninsular Component.

Moreover, Shri. Shajatnan pointed out the NWDA's involvement in prioritised link projects under the interlinking of rivers initiative, including the Ken-Betwa Link Project, Godavari-Cauvery Link Project, and Modified Parbati Kalisindh-Chambal Link Project, aimed at effective implementation. Shri. Shajatnan, also cited several success stories of the NWDA, such as the Perivar-Vagai Link and the Parambikulum-Alivar Project, highlighting its significant contributions to water schemes and overall water sustainability efforts.

Under Watershed Sustainability, he also shared the experiences of the Kerala-Ahad (Kila) project, where tradition blends with modernity and the tourism sector plays a significant role. The project encompasses the Nilgiri Biosphere Reserve and is implemented by AHAD, an autonomous society under Rural Development, Government of Kerala. Its objective is the eco-restoration of degraded wasteland and the promotion of sustainable livelihoods, with a special focus on indigenous communities, utilising participatory resource management methodologies.

Their approach involves watershed-based resource management with participatory planning, implementation, monitoring, and evaluation through people's institutions. The project spans the basins of two rivers and is divided into 15 major watersheds, further segmented into 146 micro-watersheds.

Shri. Rakesh Kashyap, Chief Engineer (Dam Safety Organization) & Project Director (DRIP), CWC, Delhi

Shri. Rakesh Kashyap, in his presentation on "Dam Safety and Challenges," highlighted India's post-independence struggle with food security, heavily reliant on agriculture and irrigation, which necessitated significant investments in dam construction for storage purposes. He underscored the critical importance of dam safety in India, given the substantial public investment involved and the risks posed to human life, ecology, and public & private assets. The occurrence of several dam failures, particularly during floods, prompted the Government of India to initiate Dam Safety plans and projects. Several factors led to the initiation of the Dam Rehabilitation and Improvement Project (DRIP) Phase II and Phase III schemes. These schemes encompassed project components such as the rehabilitation of dams and associated structures, institutional strengthening for dam safety, incidental revenue generation for sustainable operation and maintenance, and project management.

Shri. Kashyap also highlighted the Government of India's passage of the Dam Safety Act, 2021, aimed at evolving uniform dam safety procedures nationwide. The institutional framework established by the Act includes provisions for constituting Central and State Level bodies to operate within their respective jurisdictions. Significant provisions of the Act include conducting risk assessments, comprehensive dam safety evaluations, monitoring vulnerability and hazard classification, preparing reservoir filling plans, maintaining records, and conducting pre and post-monsoon inspections in accordance with regulations.

Additionally, Shri. Kashyap pointed out various dam safety challenges such as ageing dams, reservoir sedimentation, climate change, seismic safety, trained manpower, instrumentation, and others, each posing a threat that requires addressing. To tackle these challenges, DRIP introduced the Emergency Action Plan (EAP) and published guidelines for Mapping Flood Risk Assessment with Dams (January 2018) and Developing Emergency Action Plans for Dams (February 2016). They also implemented comprehensive dam safety evaluation (CSSE) and risk assessment measures.

Looking ahead, Shri. Kashyap outlined safety measures, including prioritising the safety of large dams, enacting the DSA 2021, capacity building for all stakeholders, strengthening institutional mechanisms, ensuring adequate funds for proper operation and maintenance, international collaboration with experts, and positioning India as a beacon for dam safety for South Asian and African countries.

Shri. P.K. Singh, Scientist 'E', National Institute of Hydrology (NIH), Roorkee

Shri. P.K. Singh spoke about "India's Population, Land and Water Resources," emphasising that the National Irrigation Hydrology (NIH) operates based on needs arising from various factors such as irrigation, commercial use, livestock, hydroelectricity, mining, industry, energy, and domestic purposes. He noted the increasing competition for scarce resources, particularly freshwater, in both developed and developing countries. To address this, he highlighted the construction of new storage structures to match supply and demand, manage floods and droughts, ensure food security, and mitigate the effects of monsoons.

Regarding the Interlinking Water Development Agency, Shri.Singh mentioned that Interlinking of Rivers (ILRs) is a long-term plan aimed at effectively managing India's water resources by connecting rivers through a network of reservoirs and canals. The National Water Development Agency (NWDA) has identified 14 links under the Himalayan Component and 16 links under the Peninsular Component.

He also discussed the implications of population growth, urbanisation, industrialization, and climate change on water demand, stressing the need for sustainability in agricultural water usage. With agriculture consuming approximately 70% of water resources, improving water use efficiency becomes crucial to mitigate negative impacts such as aquifer depletion, reduced river flows, wildlife habitat degradation, and salinization of irrigated lands. Shri. Singh outlined goals for water quality improvement by 2030, aiming to reduce pollution, minimise hazardous chemical release, treat wastewater, and increase recycling and safe reuse globally.

Dr. Ramesh Thangavel, Principal Scientist, ICAR Research Complex for NEH Region, Umiam, Meghalaya

Dr. Ramesh Thangavel addressed the topic of "Water Resources and Their Management in the North East Hill Region under Climate Change Scenario." He highlighted fourteen thrust areas identified by ICAR, NEH Region, Meghalaya, aimed at promoting sustainable hill agriculture. These areas include efficient soil and water conservation, soil acidity amelioration, and jhum improvement, among others.

Dr. Thangavel also emphasised the challenges posed by water scarcity in the North East states, despite the region's inland water resource potential and utilisable groundwater resources for irrigation. Major hydrological problems in the area include rainfall variability (both temporal and spatial), undulating topography, excess moisture during the rainy season, long dry spells, and droughts even in the rainy season, and moisture stress during the winter season.

To address these challenges, Dr. Thangavel mentioned several water storage approaches recommended by ICAR, such as rainwater harvesting techniques like the watershed approach involving catch pits, contour trenches, RCC check dams, and loose boulder check dams. Additionally, he highlighted agronomic practices like mulching, micro-irrigation, and modifying plant population and spacing.

Additionally, Dr. Thangavel stressed the importance of water for development globally. He pointed out that the National Water Policy of India prioritises various water uses such as drinking water, irrigation, agriculture, hydropower, and supports the needs of mines and industries.

Shri. K. B. Paul, General Manager, NEEPCO

During his presentation on "Water & Infrastructure," Shri. K. B. Paul informed the audience that NEEPCO specialises in hydro plants and operates 12 power stations in the region with a total capacity of 2057 MW. He highlighted that besides power generation, hydro power projects also contribute to overall development by providing various benefits, including:

i. Infrastructure development such as roads, bridges, telecommunication facilities, and transmission lines,
ii. Creation of model villages,
iii. Provision of educational, medical, and cultural facilities, as well as banking services, post offices, markets, etc.

Shri. Paul also mentioned several future projects of NEEPCO that will benefit the general public, including two hydro power projects for which MOUs have already been signed in Meghalaya and Arunachal Pradesh, along with planned pumped storage projects and solar projects.

Furthermore, he discussed water conservation practices in the North Eastern region of India, which vary from traditional methods such as bamboo pipes for spring/seepage and construction of small check dams to modern methods like rooftop rainwater harvesting and panikheti (construction of terraces to retain runoff water in fields for cultivation).

*Scan the **QR Code** to watch the live video of the*
***Technical Session -** Water and Infrastructure Development*

TECHNICAL SESSION

Water, Climate & Disasters

The session delved into the intricate interlinkages among water, climate, and disasters, with a specific emphasis on the hilly terrains of India. Attendees engaged in discussions surrounding the multifaceted challenges posed by these interconnections and explored various preventive, remedial, and resilience-building measures. By addressing the complexities of water systems within the context of climate and disaster mitigation initiatives, participants sought to gain a deeper understanding of the unique dynamics at play in hilly regions. Through collaborative dialogue and knowledge exchange, the session aimed to identify effective strategies for managing and mitigating the impacts of climate-related disasters on water resources in these challenging terrain settings.

Moderator:

Shri. Saransh Bajpai, Associate Director, Climate, WRI, New Delhi

Shri. Saransh Bajpai, cordially greeted the panellists as they ascended the dais, delivering a succinct overview of the session themed around Water, Climate, and Disasters. Emphasising the salient recommendations and insights shared by each panellist, the focal point emerged as the imperative for comprehensive data management encompassing not only flood-related but also climate-related data, bolstered by robust modelling to facilitate timely warnings. Moreover, attention was drawn to the adverse impact of forest degradation on water systems, underscoring the necessity for Meghalaya State to adopt strategies for forest preservation to ensure water reliability. Furthermore, the discussion underscored the critical role of climate change finance in facilitating the execution of adaptation and mitigation endeavours. Key takeaways from the session underscored the exigency for data-informed analyses and assessments, which are pivotal in informing resilient planning processes inclusive of stakeholder engagement, thereby ensuring effectiveness and integration. Such integrated implementation endeavours aim to dismantle silos, establishing a robust framework with defined targets and indicators capable of providing essential feedback, supplemented by requisite means of implementation such as awareness campaigns, capacity building initiatives, and financial support mechanisms.

Dr. Arwind Kumar, President, India Water Foundation

Dr. Arwind Kumar, in his discourse titled “Deciphering Nexus of Water, Climate, and Disasters: From Geo-Politics to Geo-Economics,” explained the discernible impacts of climate change on the Himalayan states, manifesting in elevated average temperatures, recurrent heat waves, and heightened air pollution across the South Asian region. These environmental shifts underscore a complex web of ecological, social, and economic interdependencies.

Dr. Kumar emphasised that anthropogenic activities such as deforestation, overfishing, and indiscriminate waste disposal have significantly contributed to the degradation of ecosystems. He further underlined the imperative of addressing transboundary water risks and advocated for a synergistic approach to Sustainable Development Goals (SDGs), highlighting their inherent interconnectedness. Advancing on SDG, Dr. Kumar asserted inherently advances progress towards others.

Considering the prevailing challenges posed by climate change, Dr. Kumar called for heightened ambition and the initiation of fresh initiatives. He stressed the significance of fostering shared prosperity through innovation and coordinated efforts, emphasising the pivotal role of water cooperation in regional development. He also proposed the adoption of a Multi-Track Water Diplomacy framework to augment cooperation beyond bilateral relations.

The way forward, according to Dr. Kumar, entails the establishment or fortification of appropriate institutions and agreements, thereby creating conducive conditions for investment. Recognizing water as a potent tool in mitigating climate change, Dr. Kumar put forward that the disruptions or alterations in water dynamics serve as poignant indicators of climate change. Thus, leveraging water resources effectively emerges as a cornerstone in combating climate change and fostering sustainable development.

Dr. Aditi Kapoor, Co-founder, Alternative Futures, New Delhi

Dr. Aditi Kapoor, in her discourse on adaptation of best practices, emphasised the indispensable relationship between water and vegetation, asserting that a comprehensive ecosystem approach is pivotal for a sustained development. Through graphical presentations, Dr. Kapoor illustrated that addressing various climate change-related challenges such as fallen trees, sediment discharge and landslides can be effectively tackled by adopting an ecosystem-based framework.

Highlighting the significance of considering long-term climate changes alongside immediate disaster mitigation efforts, Dr. Kapoor cited examples such as the rejuvenation program in Sikkim, which inadvertently led to landslides. He further elucidated that reforestation endeavours in regions like the Cherrapunji desert encounter challenges due to the absence of water pockets, hampering the provision of essential nutrients for vegetation. Dr. Kapoor cautioned against the pitfalls of monoculture practices, emphasising the need for diversified approaches in mitigating climate change impacts.

Advocating for a forward-looking perspective encompassing a 50–60-year timeframe, Dr. Kapoor underscored the imperative of preserving, protecting, and rejuvenating water and other vital resources. He proposed a comprehensive three-dimensional approach that integrates actions impacting blue water, green vegetation, and grey infrastructure (built-up areas). He stressed on the necessity of an integrated ecosystem policy framework at the state level, facilitating access to and management of blue, green, and grey resources. Drawing upon successful examples such as the utilisation of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme by Panchayat women leaders in Himachal Pradesh to implement water harvesting structures in forests, Dr. Kapoor highlighted the multifaceted benefits of such multi pronged approaches. These initiatives not only aid in forest fire prevention but also contribute to soil moisture retention and livelihood enhancement.

In summary, Dr. Aditi Kapoor advocated for a holistic and forward-thinking approach to climate change adaptation, emphasising the imperative of integrating water, vegetation, and built infrastructure considerations within an ecosystem-based framework.

Shri.Tithal Parmar, WASH Specialist, UNICEF

Mr. Tithal Parmar, in his discourse on Water, Sanitation, and Hygiene (WASH), shared his insights and experiences regarding the approaches undertaken in the state of Meghalaya. He emphasised the disproportionate impact of disasters and extreme weather events on the most vulnerable segments of society, including women, children, and the elderly.

He underscored the importance of comprehensively understanding Disasters and Climate Risk from all dimensions, including vulnerability, capacities of various stakeholders, and hazards such as landslides and floods. He advocated for a systematic approach across all sectors and levels of governance, emphasising the need to quantify risk by understanding the underlying hazards.

Highlighting Meghalaya's efforts in implementing initiatives such as the Jal Jeevan Mission (JJM) and the Swachh Bharat Abhiyan, he lauded the strategic partnerships with entities like the Kerala State Disaster Management Authority, citing the collaborative response to the 2018 Kerala flash floods. He detailed the challenges faced during the floods, including submerged water sources, overflowing septic tanks and the absence of a system for sludge management, which compromised drinking water quality. The UN's Post Disaster Needs Assessment facilitated the formulation of a comprehensive plan of action, quantifying the loss and damage assessment.

Shri. Parmar also gave reference to the 2022 Assam floods, reiterating the critical importance of safeguarding drinking water and sanitation as a primary response. He highlighted the distribution of emergency water treatment units during this period.

Recognizing the crucial role of finance in adaptation and implementation efforts, he advocated for advocacy at higher levels for climate-resilient planning and development. He proposed allocating three percent of the total budget for all departments towards climate action planning at the state level.

In summary, Shri. Parmar emphasised the necessity of a coordinated and proactive approach towards addressing water, sanitation, and climate-related challenges, with a focus on vulnerability. reduction, capacity building, and strategic partnerships for effective disaster response and climate resilience.

Dr. Vishal Singh, Scientist 'D', NIH Roorkee

Dr. Vishal Singh, in his presentation on "Risk Assessment and the Development of Flood Forecasting Systems", emphasised the impact of climate change on glacial retreats and runoff components, particularly in the Himalayan regions. Citing recent findings from the IPCC assessment report, Dr. Singh highlighted the alarming increase in global average temperatures and its consequential effects on Himalayan glaciers.

Dr. Singh gave reference to the studies conducted by the National Institute of Hydrology (NIH), revealing a significant temperature rise of 1.5 degrees Celsius in the Higher Himalayan areas, resulting in glacier recession. He noted that while glaciers at very high elevations are less affected, those in moderate elevation ranges experience considerable retreat. Dr. Singh pointed to recent events such as the outburst of the South Lhonak Lake in Sikkim, which necessitated the development of an early warning system to mitigate adverse impacts on lives and infrastructure.

In addressing these consequences, Dr. Singh advocated for the development of an early Flood Warning System and the analysis of long-term effects, particularly regarding the increasing volume of lakes around glacial regions. He highlighted the importance of an integrated approach, wherein data is generated and input into hydrological models, calibrated, and utilised for real-time forecasting of disasters.

Responding to a query regarding the effectiveness of flood forecasting systems in Sikkim considering the climatic conditions and terrain, Dr. Singh emphasised the need to install an adequate number of instruments to understand flash flood conditions. He stressed the importance of an integrated approach encompassing hydrological and hydraulic analyses, ensuring the accuracy of all parameters. Dr. Singh emphasised the significance of a robust data management system and modelling framework to provide early warnings, minimising uncertainties in disaster forecasting.

In conclusion, Dr. Vishal Singh underscored the necessity of integrated data management and robust modelling techniques to effectively forecast and mitigate the impacts of floods in regions susceptible to climate change-induced glacial retreats and runoff fluctuations.

Dr. B. K Tiwari, Former Head of Department, Department of Environmental Studies

Dr. B. K Tiwari, in his presentation, "Meghalaya-centric climate and water dynamic", highlighted the increasing trends in temperature and rainfall in the region, coupled with projections of heightened frequency of heatwaves and extreme wet days. He underscored the importance of addressing forest conservation as a cornerstone of climate change adaptation strategies for the state.

Dr. Tiwari emphasised the critical role of forests in maintaining water reliability within the Meghalaya ecosystem, as they serve as primary sources of water springs. He stressed the urgent need for measures to halt the degradation of forest covers, emphasising that forest health improvement should be prioritised as a fundamental aspect of climate change adaptation efforts.

Acknowledging that communities with greater forest coverage experience lesser impacts from climate change, Dr. Tiwari advocated for the promotion of mixed cropping over monoculture large-scale plantations, encouraging diversified cropping practices that can contribute to forest conservation while enhancing resilience to climate change impacts.

In summary, Dr.Tiwari proposed a proactive approach to forest conservation in Meghalaya, recognizing its pivotal role in ensuring water reliability and mitigating the adverse effects of climate change. By prioritising forest health improvement and promoting diversified cropping practices, the state can effectively adapt to changing climatic conditions and safeguard its ecosystems and communities.

Shri. Albert Chiang, OSD, MBDA

Shri. Albert Chiang, in his presentation, "Meghalaya's Climate Action Planning - Water & Disaster Management Sectors", shed light on the historical context of climate challenges, citing the 600-year drought that impacted civilizations globally. He gave reference to the geological studies on stalagmites in Cherrapunji, correlating historical drought patterns with calendar records. He highlighted the establishment of the Climate Change Centre under the National Mission for sustaining the Himalayan ecosystem, operationalizing various missions under the Meghalaya Climate Change Centre.

Citing the UN's 2015 report, Shri. Chiang emphasised that over 90% of natural disasters are weather-water-related, including droughts, wildfires, pollution, and floods. He presented projections indicating an increase in rainfall ranging from 3% to 7% in the short term and up to 13% in the longer term. Additionally, areas such as South West Khasi Hills and West Khasi Hills are identified as high-risk zones for landslides due to increased precipitation. He further stressed on the correlation between rising temperatures and extreme rainfall in hilly terrains, where every degree increase in temperature leads to a 50% rise in extreme rainfall.

Regarding the Meghalaya State Action Plan on Climate Change, Shri. Chiang outlined the efforts to integrate climate action into the state budget, with 15% of the budget allocated to climate-relevant actions in 2023-24. Collaborating with the World Resources Institute India, they are tracking climate action expenditures across 90 departments. Furthermore, initiatives like Mission Amrit Sarovar aims to develop water bodies in each district, emphasising the localization of climate action.

Responding to a query on community action in water policy, Shri. Chiang highlighted a 600 Cr. program with the ADB focused on constructing water harvesting structures, with sites chosen based on community interest. He stressed the importance of robust planning with stakeholders, emphasising community participation, integrated implementation, and a framework with targets and indicators supported by awareness, capacity building, and finance.

In conclusion, Shri. Chiang emphasised the significance of community inclusion in water policy, advocating for collaborative planning and implementation strategies to address climate challenges effectively in Meghalaya.

*Scan the **QR Code** to watch the live video of the **Technical Session -** Water, Climate and Disasters*

TECHNICAL SESSION

Spring Shed Development

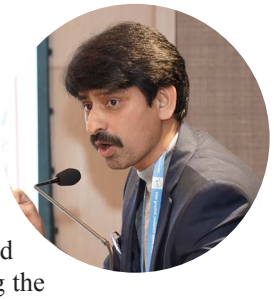
The session provided an in-depth exploration into the vital role of spring-based water systems, particularly within the challenging terrain of hill regions. Attendees delved into the significance of these natural resources and engaged in discussions aimed at formulating a comprehensive roadmap for their protection, development, and long-term sustainability. Through collaborative dialogue and knowledge sharing, the session sought to address the unique challenges faced by these water systems and identify effective strategies to ensure their continued viability and availability for communities reliant on them.

Moderator:

Shri. Kunal Upasani ACWADAM, Pune

Mr. Kunal Upasani opened the discussion by providing insights on the main focus of ACWADAM, which is groundwater management, training communities, state and central officials, and other stakeholders, as well as carrying out decision-making in various projects. ACWADAM also provides input on different policies, programs, and groundwater-related projects across the country. Apart from this, the main focus of ACWADAM is bringing communities together, as they play an important role in many natural resource management projects in different ways. He further stated that springs are over-utilized everywhere, with a large demand from people, leading to stress on springs. Therefore, there is a need for systematic management of springsheds. ACWADAM has studied a large number of springs in India and found depletion due to various factors like climate change, natural calamities, and land use. For this, Mr. Upasani added that ACWADAM has developed a 6-step methodology, with the help of ICIMOD, for comprehensive mapping of spring-sheds, data monitoring, including hydrogeological mapping, and other impacts of spring revival activities. Over time, ACWADAM has generally followed a down-to-earth approach to spring-shed management and has provided support to neighboring countries like Bhutan and Nepal in spring-shed management works.

Dr. S. S. Rawat, Scientist 'F', NIH, Roorkee



Dr. S. S. Rawat, while discussing "Springshed Management in India," highlighted the initiatives taken by NIH (National Institute of Hydrology), Roorkee, an organisation operating under the Ministry of Jal Shakti. He emphasised that the Ministry of Jal Shakti has spearheaded the country's first springshed management efforts.
Dr. Rawat underscored the stress on mountain rivers, particularly in the Indus and Ganges-Brahmaputra river basins, which are crucial for India, Pakistan, Bhutan, Tibet, Nepal, and Bangladesh. He noted the alarming decrease in water levels in the Indus basin, emphasising the significance of springs in maintaining the base flow of rivers. Dr. Rawat further explained that springs are the primary source of potable water in mountainous regions, as the supply from glaciers and rivers is not economically viable due to location disadvantages.

He elaborated on the three main purposes of spring studies: increasing water accessibility in mountain villages/hamlets, reducing the burden on hill women for water collection, and providing essential information for government water schemes like the Jhal Jeevan Mission. Dr. Rawat also highlighted the six Sustainable Development Goals related to springshed management, stressing the need to address equity issues to achieve these goals.

Regarding the regional distribution of springs in India, Dr. Rawat categorised them into the Indian Himalayan region, Central, Western Ghats, and Eastern Ghats, noting their presence in biodiversity hotspots. He expressed concern over the declining number of springs, leading to increased hardship for communities. Dr. Rawat highlighted the recommendations of the NITI Ayog Report, emphasising the importance of creating a web-enabled database/web portal for mapping and tagging springs.

Dr. Rawat stressed the importance of data sharing and the need for a spring census, which NIH has initiated. He discussed the benefits of a Web GIS-based spring inventory, including understanding the present status of space and time, protecting local springs during development expansion, and prioritising funds for springshed activities.

He mentioned the initiatives taken by various agencies, such as the Dhara Vikas Programme, PSI, PES, and the newly constituted SARRA (Spring and Rivers Rejuvenation Authority) by the Government of Uttarakhand. Dr. Rawat emphasised the need for a common platform to store all data related to springshed management.
Queries arose regarding communication gaps at the state level in identifying springs and the quantitative information obtained from the survey. Dr. Rawat explained that spring criteria depend on measurement methods and devices, which vary based on topography.

Shri. Abhishek Likam, Head Springshed, CHIRAG, Uttarakhand

Shri. Abhishek Likam addressed the topic "Experiences in Himalayan Context: Seismological Components of Springshed Management," focusing on CHIRAG's commendable community involvement in implementing and sustaining springshed management initiatives. CHIRAG has developed four main approaches for springshed management: natural resources management, education, livelihood, and broadcasting.

He outlined CHIRAG's journey in springshed management from 1986 to the present, highlighting the transition from technical approaches to integrating social components for sustainability. CHIRAG has successfully treated over 400 springs, adapting interventions based on community needs and utility. Additionally, they have implemented engineering measures for springshed development. Shri. Likam emphasised CHIRAG'ss various measures, including vegetative and social approaches aimed at conserving water, ensuring hygiene, and involving communities in decision-making processes. He stressed the importance of collective community involvement for the success of interventions.

Monitoring and evaluation play a crucial role in springshed management, requiring specialised knowledge in geology and hydrology. CHIRAG has developed a cadre of hydro-parazoologists to conduct independent studies and disseminate information effectively. Despite challenges in implementation, Shri. Likam praised the progressive approach of the Meghalaya government and highlighted the significance of partnerships for addressing springshed management challenges. He addressed the question of why the springshed approach is essential, citing groundwater extraction around industrial areas and the negotiation process for accessing and benefiting from resources.

Looking ahead, Shri. Likam emphasised the importance of awareness, capacity building, and collaboration among various stakeholders to achieve the objectives of springshed management at both national and rural levels. He concluded by mentioning CHIRAG's ongoing efforts in preparing a comprehensive implementation report.

Shri. Gunanka D.B, IFS, Joint Secretary, Planning and Additional Project Director, CLLMP, Meghalaya

Shri. Gunanka D.B. spoke about "Addressing Water through Community Springshed Management." He discussed the activities of the Meghalaya Basin Development Authority (MBDA), which primarily focuses on community and natural resource management and livelihood sectors. Despite being one of the richest states in terms of springshed, Meghalaya faces threats due to natural landscape changes. Shri. Gunanka emphasised the importance of understanding climate change at the community level and highlighted the dependency of villages on springs for various purposes.

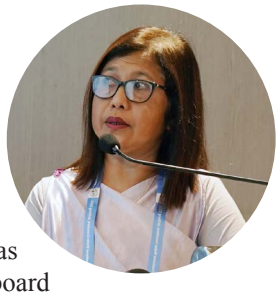
Shri. Gunanka also mentioned the JICA-funded project called MegLIFE, which includes an "Entry Point Activity" allowing communities to choose activities related to natural resource management (NRM) and water. Despite initiatives like Jal Jeevan Mission, which aims to provide water access to households, many villages still face challenges in accessing water. He discussed the decline in Meghalaya's forest cover and highlighted MBDA's approach of working with communities for springshed protection and conservation. Shri. Gunanka emphasised the bottom-up approach of MBDA, which involves training village community facilitators and natural resource management committees to conduct various activities, including water parameter measurements and seed ball preparation.

Shri. Gunanka mentioned that over 55,000 springs have been mapped in Meghalaya, constituting a significant inventory unmatched by any other state in India. He also discussed the implementation of Meghalaya's Water Policy in 2018 and various initiatives like Payment for Ecosystems (PES) under the Green Meghalaya scheme to conserve natural forests.

Additionally, Shri. Gunanka discussed the challenges and approaches in springshed revival, emphasising the need for proper scientific facilitation. Despite challenges due to COVID-19, MBDA is working on springshed management under projects like JICA funded MegLIFE.

During the discussion, concerns were raised about the gap between fund utilisation and fund generation from springs and the need to involve the Ministry of Development of North Eastern Region (DONER) in springshed management. The integration of Jal Jeevan Mission data with the spring map and collaboration with other departments were also discussed to address these challenges effectively.

Smt. A. D. Blah, Chief Engineer, Water Resource Department, Meghalaya



Smt. A. D. Blah, addressed the audience on "Spring Inventory, Monitoring, and Rejuvenation." She highlighted that springs are crucial water sources for nearly 70% of villages in Meghalaya, playing a vital role in providing water security to rural households. However, climate change impacts have led to the seasonal nature of some springs.

The Water Resource Department, under the Meghalaya Springs Protection (MSP) project, has covered 12 districts, 55 blocks, and 6702 villages in Meghalaya for spring mapping. A Dashboard of springs has been developed for decision-making and prioritisation. Despite challenges in cost tracking, the Department conducted training sessions and developed a mobile app for spring mapping. The survey under the National Hydrological Project involved mapping and implementation planning.

As of March 31, 2023, 90% of the target villages were physically surveyed, and financial awards were made for 50% of them. Data verification is ongoing, with the report pending submission. The Spring Inventory Dashboard revealed the status of springs, with clear, muddy, objectionable, and unobjectionable categories identified. The data collected will aid in planning and decision-making for various departments and organisations.

Looking ahead, the Department plans to focus on springshed management after the National Hydrology Project concludes in 2025. Pilot projects, such as the Springshed Management for Jowai Town, will be initiated, along with regular discharge monitoring. The Department aims to conduct the 1st Spring Census under the Ministry of Jal Shakti to improve data collection, particularly in remote areas.

Smt. Blah emphasised the importance of GIS analysis for estimating the actual number of springs, which could exceed 20,000 based on first-order streams. She expressed hope that future surveys would provide comprehensive data on all springs in Meghalaya. Additionally, she highlighted the Department's efforts in generating a GIS-based drainage map to identify potential spring sources.

Additionally, Smt. Blah reiterated the significance of springs in Meghalaya's water security and the Department's commitment to comprehensive data collection and management for effective resource planning.

Dr. Subash Dhakal, Deputy Director, Rural Development Department, Govt. of Sikkim

Dr. Subash Dhakal in his presentation, "Dhara Vikas: ASpring Revival Initiative in the Sikkim Himalaya" shared insights from the Rural Development Department's experiences in Sikkim. He emphasised their role as the oldest institution in springshed development, beginning in 2008. Dr. Dhakal highlighted the distinction between watersheds and springsheds, noting the focus on spring signs and the need for a specific approach to address spring-related issues.

He explained that their project, initially excluded from state budget books, gained recognition in 2012 when it was included in the permissible list for MGNREGA work by the Planning Commission. With minimal budget requirements, most activities rely on labour, with materials sourced through partnerships with other government agencies.

Discussing water resources in the Himalayas, Dr. Dhakal emphasised the significance of springs as the primary source of drinking water in mountain villages. Climate change impacts have led to seasonal springs, affecting water supply systems and necessitating rural development interventions.

The Rural Development Department's journey in spring revival began in 2008, focusing on learning by doing. They achieved notable success in watershed management activities, including reviving numerous springs and lakes. Capacity building initiatives, vulnerability assessments, and the creation of a Spring Atlas Website were integral to their approach.

Dr. Dhakal outlined their methodology for springshed mapping, including hydrogeological assessments and recharge structure implementation based on slope considerations. The aquifer approach shifted focus from water sources to aquifers, with interventions aimed at replenishing aquifers to revive springs.

Success stories shared, highlighted the positive impact of spring revival projects on water availability, livelihoods, and ecosystems. Convergence with various departments, such as the Forest Department, facilitated technical surveys and implementation activities.

Addressing ongoing challenges, Dr. Dhakal emphasised the need for conceptual studies, technical expertise, funding, and data dissemination. Future plans include setting up a Critical Zone Observatory, strengthening database management, and incorporating advanced techniques for springshed management.

He acknowledged implementation constraints in certain areas and emphasised knowledge sharing activities to promote springshed management nationwide.

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TECHNICAL SESSION

Source Sustainability

The session was dedicated to understanding the multifaceted measures essential for safeguarding the sustainability of aquifer systems in hill regions. Participants engaged in comprehensive discussions aimed at identifying key strategies to prioritise in order to protect and sustain these vital water sources. Through collaborative dialogue and expert insights, the session aimed to develop a nuanced understanding of the challenges faced by aquifer systems in hilly terrains and proposed a comprehensive set of actions to ensure their long-term viability and resilience.

Moderator:

Shri. Asad Umar, Aga Khan Development Network (AKDN)

Mr. Asad Umar opened the session with a poignant reflection on the repercussions of water scarcity, whether in agricultural contexts or for potable use. Furthermore, he highlighted the escalating challenges in urban-rural water supply witnessed in recent times. Against the backdrop of long-term climate insecurities and burgeoning demands, particularly in a populous nation like India, serving approximately 820 million individuals across 12 river basins, the imperative for water accessibility looms large, with per capita availability nearing the threshold of water scarcity at a thousand cubic metres. While the current scenario appears less than sanguine, the prospect of annual rainfall and adept source management offer a ray of hope towards ensuring water security across diverse sectors. Notably, Meghalaya's remarkable strides, elevating water access from a mere 1% to 70%, underscore the efficacy of concerted efforts in bolstering household tap connections. Emphasising the necessity for regulatory frameworks to rationalise water utility pricing, Mr Khan, underscored the pivotal role of collaborative engagement among all stakeholders to safeguard sustainability. Indeed, Meghalaya serves as a beacon, exemplifying the significance of localised solutions to global challenges, achievable through community engagement and grassroots water conservation initiatives.

Shri Andaleeb Razi, IRTS, Commissioner & Secretary. PHE Meghalaya

Shri Andaleeb Razi shared that in Meghalaya, ensuring the sustained availability of ample water resources throughout the operational lifespan of Water Supply Systems (WSS) stands as a paramount necessity to adequately cater to the needs of its 22 urban regions, inclusive of those under Municipal Boards' governance. These regions rely upon a diverse array of water sources, predominantly constituted by surface sources, which contribute approximately 80.83% to the overall supply, followed by groundwater aquifers at 19.17%, alongside spring sources. However, the sustainability of these resources confronts formidable challenges emanating from escalating population dynamics, heightened economic activities, and multifaceted constraints on the supply front, encompassing climatic variations, pollution, and environmental degradation.

In response to these exigencies, concerted endeavours are underway to implement strategies geared towards bolstering the sustainability of water sources. Notably, substantial investments are being channelled into infrastructure development initiatives aimed at fortifying the long-term viability of these vital resources. Furthermore, an exhaustive scrutiny of the Jal Jeevan Mission (JJM) since its inception underscores the persistent endeavours to augment water supply and sanitation infrastructure across urban domains within the state. Emphasis is placed on integrating sustainability measures into the fabric of these initiatives to effectively address both prevailing exigencies and projected future demands.

Dr. Debasish Chakraborty, Scientist in Agricultural Meteorology, Indian Council of Agricultural Research (ICAR), Umiam

Dr. Debasish Chakraborty, while speaking about "Water Availability and Its Efficient Utilisation in Hill Agriculture: Experiences of ICAR-NEH," elucidated upon the profound influence of climate change on hydrometeorological disasters, particularly underscoring its ramifications on agriculture due to its heavy reliance on water. He highlighted the distinctive rainfall dynamics of Northeast India vis-à-vis the rest of the nation, revealing a notable doubling of uncertainty in annual rainfall changes across the region. Despite historical records indicating elevated monsoon season precipitation, a troubling downward trajectory has been observed over the past three decades, exacerbating agricultural challenges. Moreover, the escalating annual maximum temperatures in the Northeast region escalate evaporation demands, thereby placing additional strain on water resources.

Climate projections specific to the Northeast Himalayan Region depict a disconcerting paradox of moisture surplus and deficit, profoundly impacting crop yields. Dr. Chakraborty stressed on rainwater conservation as a pivotal strategy, particularly during surplus seasons, with ICAR strategically tailoring technologies for water conservation in hilly terrains. These interventions encompass watershed and micro-watershed approaches, rainwater harvesting, roof water harvesting, and solar pumping, aimed at facilitating groundwater recharge and supporting ancillary activities such as fishery and piggery. Noteworthy initiatives such as Jalkunds, boasting a capacity of 35,000 litres, offer resilience during periods of water stress.

Furthermore, Dr. Chakraborty accentuated the efficacy of cost-effective measures such as roof water harvesting and in situ rainwater harvesting, including mulching, organic soil incorporation, and moisture conservation techniques. These methods have exhibited promising results, manifesting significant crop yield increases ranging from 20% to 28%. ICAR's initiatives extend to the development of stress-tolerant crop varieties and the promotion of community-led interventions through demonstrations and dissemination in farmers' fields.

Dr. Chakraborty stressed upon the promotion of both in situ and ex situ rainwater harvesting, with a continued focus on developing resilient crop varieties and leveraging renewable energy for harvested water utilisation. The integration of modern technologies such as remote sensing, drones, and artificial intelligence holds promise for effective site suitability mapping and advancing agricultural innovation toward sustainability objectives.

Shri. Wankit K. Swer, General Manager, Knowledge Management, Meghalaya Basin Management Agency (MBMA)

Speaking on "Community Based Approach for Water Source Conservation," Shri. Wankit Swer delivered a comprehensive overview of the operational framework of the Meghalaya Basin Development Authority (MBDA), accentuating the imperative necessity for specialised institutions to address prevailing lacunae notwithstanding the presence of numerous technical departments. In a state governed under the ambit of the 6th schedule, wherein approximately 95% of land is communally owned, Shri. Swer, underscored the indispensable role of community consultation in facilitating effective decision-making processes.

Drawing upon the NESAC Report of 2009, which delineated acute deprivation in approximately 1,900 out of 6,000 villages, Shri. Swer underscored the urgency for adopting a community-centric approach to water source conservation. Villages surveyed reported primary concerns centred around water scarcity, exacerbated by the precarious condition of surface water sources. Meghalaya's heavy reliance on surface water resources underscores the pressing need to address the severe degradation of natural assets, prompting the meticulous mapping of 55,000 springs across the state.

Embracing a holistic paradigm, concerted endeavours are underway to safeguard and preserve water sources, accentuating the imperatives of capacity building, institutional fortification, and decentralised governance to pinpoint intervention focal points. Village Employment Councils emerge as pivotal stakeholders in project implementation, bolstered by the support of Village Community Facilitators and Data Volunteers. Harnessing the capabilities of Geographic Information Systems (GIS), remote sensing technologies, and community-accessible applications, the overarching aim is to furnish advisory services to community members.

In the pursuit of sustainability, Shri. Swer, highlighted multifaceted initiatives encompassing the cultivation of community ownership, the implementation of payment for ecosystem services schemes, and the alignment of conservation endeavours with the Carbon Market, thereby leveraging existing global green funds for sustenance and support.

Kumari Iaraphunlin Diengdoh, Joint Mission Director at the State Rural Employment Society (SRES)

Kumari Iaraphunlin Diengdoh, while speaking on, "Source Sustainability - MGNREGA Perspective," provided an insightful perspective on the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which spans across 12 districts, 55 blocks, covering 6,406 villages and serving a populace of 12.33 lakh individuals.

Kum. Diengdoh shared that since its inception in 2006, MGNREGA has predominantly focused on bolstering rural connectivity and addressing the prevailing needs of the majority community in this domain. However, a significant paradigm shift in approach towards water and natural resource management commenced in 2016, culminating in the initiation of Integrated Natural Resource Management programs. Under this initiative, she said that a wide array of activities including the establishment of plantations and nurseries, rejuvenation of spring sheds, aquifer recharge through trenches, and the integration of Geographic Information System (GIS) plans for Natural Resource Management (NRM) have been undertaken.

Kum. Diengdoh highlighted that a Participatory Rural Appraisal conducted alongside the inauguration of the Jal Shakti Abhiyan (JSA) in 2019 brought to light water scarcity and drinking water shortage as primary concerns voiced by villages. In response to these pressing challenges, approximately 60% of community expenditures were allocated towards NRM and water-related activities. She further maintained that the establishment of Natural Rural Management Committees at Village Employment Councils (VECs) has facilitated community engagement, with a significant contribution of over 2244 crores directed towards nature and water conservation efforts.

Speaking about women's leadership, Kum. Diengdoh shared that the promotion of women's leadership has been actively encouraged, fostering convergence with other departments to enhance the efficacy of initiatives. Noteworthy accomplishments include the creation of 291,538 completed and 99,405 ongoing projects under MGNREGA, with approximately 65,000 assets dedicated to water conservation endeavours. Efforts have also been directed towards fortifying VECs by promoting women leaders, with 4,491 out of 6,400 VECs having women in leadership roles.

Additionally, she emphasised that the primary goal is to offer localised solutions to global challenges by ensuring groundwater recharge, runoff water harvesting, and the revival of arid sources. The focus is on transferring ownership of land and water to future generations, effectively tackling climate change issues and promoting sustainable ecosystems. Furthermore, she highlighted the operation of over 5,000 Natural Resource Management Committees (NRMCs) in 6,000 villages, with a specific aim to allocate at least 60% of funds for NRM activities.

Shri. Nripendra Kumar Sarmah, Chief Engineer in the Public Health Engineering (PHE), Assam

Shri. Nripendra Kumar Singh, spoke about "Sustainable Approach in Drinking Water Supply Sector in Assam" and expounded upon the imperative of adopting a sustainable approach in the drinking water supply sector within the region. He said that the exigency for enhanced water management is underscored by propositions advocating for the establishment of both an interdepartmental committee and an interstate committee, focusing explicitly on water-related issues, particularly among the Northeast (NE) states. He further said that drawing a clear distinction between water availability and access to safe drinking water, paramount importance is accorded to ensuring the accessibility, availability, and safety of drinking water.

Where mobilisation is concerned, Shri. Singh said that community mobilisation emerges as a pivotal factor in addressing the prevalent water challenges, particularly in regions such as Assam, where reliance on groundwater predominates. He also said that sustainability of water sources, particularly in areas like Dima Hasao in Assam, assumes paramount significance, given the discernible impacts of climate change on water supply patterns.

Shri. Singh also explained that resolving transboundary issues with neighbouring Bhutan is deemed indispensable to alleviate drinking water shortages, with a particular focus on areas like Dima Hasao and Char areas where water supply presents a formidable challenge. Concerted efforts include conducting surveys to explore opportunities for transboundary cooperation with Bhutan to regulate water release from hilly streams traversing international boundaries, with the overarching goals of revenue generation and enhancing coverage and functionality.

Additionally, Shri Singh further said that the adoption of advanced technologies such as GIS monitoring and real-time monitoring of groundwater exploration serves to fortify water management endeavours, ensuring the judicious and sustainable utilisation of resources.

*Scan the **QR Code** to watch the live video of the **Technical Session -** Source Sustainability*

DAY 02

10th FEBRAURY 2024


सत्यमेव जयते
International
Water Conclave
SHILLONG 2024
GOVERNMENT OF MEGHALAYA

DAY 02

10th February, 2024

TECHNICAL SESSION

Water & Livelihoods

The session was dedicated to examining the pivotal role of water as a foundation for livelihoods in hill systems. It provided an analysis of the existing state of water-related livelihood initiatives and explored avenues for strengthening them. Through collaborative discussions and expert insights, participants aimed to identify and prioritise strategies to enhance the resilience and sustainability of livelihoods reliant on water resources in hilly terrains.

Moderator:

Shri S.C Sadhu, IAS, Secretary, Fisheries Department, Government of Meghalaya "Fisheries"

Shri S.C Sadhu, extended a warm welcome to both the esteemed panellists and eager participants, emphasising the pivotal connection between water management and livelihood sustainability. Highlighting the crucial nexus between water and livelihood creation, it was underscored that sustainability hinges upon integrating water initiatives with livelihood generation endeavours. Stressing the necessity of community involvement and the adoption of community-driven strategies, the moderator emphasised aligning efforts closely with livelihoods to ensure enduring impacts. As the session progresses, five distinguished speakers are poised to share their insights, each allotted time to present their valuable content.

Dr. Chaiwut Grudpan, Sustainable Fisheries Research Center Ubon Ratchathani University, Thailand

Dr. Chaiwut Grudpan, presented an insightful discourse on "The Environmental Sustainability of Fish and Fisheries in Mekong". He underscored the significance of fisheries in the Lower Mekong Basin (LMB), with an annual production of approximately 2.3 million tons. He provided an overview of various pertinent aspects, including the Lower Mekong Basin (LMB), and the National Water Resources Management Strategies (2015-2026). Additionally, he shed light on the role of the Office of the National Water Resources in monitoring Thailand's rainfall and water situation. Furthermore, he delved into the intricate dynamics of the Thailand Mekong Watershed, delineating its Northern, Northeastern, and Southern sub-regions. Noteworthy was his mention of the culturally rich regions and highlands inhabited by diverse ethnic tribes. Moreover, Dr. Grudpan highlighted initiatives such as fish conservation sanctuaries, local market surveys, and ecological monitoring as integral components of sustainable water resource management. He elucidated the Mekong River Commission's (MRC) commitment to sustainable development and highlighted the National Water Resources Management Strategies (2015-2026), particularly focusing on water resource management for domestic use.

Shri. Vikas Goyal, Water Resources Specialist from the Indian Resident Mission, New Delhi (ADB)

Shri Vikas Goyal introduced a transformative initiative aligned with the Meghalaya State Water Policy 2019. The proposed "India: Climate Adaptive Community-Based Water Harvesting Project in Meghalaya" targets the pervasive issue of water insecurity among Meghalayan communities. Addressing limited and seasonal access to water resources, lack of retention structures and governance challenges, the project aims to enhance community livelihoods and reduce vulnerability through climate-resilient water management.

Shri. Goyal, presented a comprehensive Problem Analysis on Watershed Development in Meghalaya, identifying the core issue as the water insecurity faced by communities in the region. The causes encompassed various dimensions, including limited and seasonal access to water resources due to natural factors such as high rainfall during the rainy season. He added that physical challenges such as the absence of water retention structures, land degradation, deforestation, and inadequate land management practices were highlighted. He further said that governance complexities, characterised by multiple government institutions with overlapping mandates and inadequate planning, management, operation, and maintenance, further compounded the problem.

In response to these challenges, Shri. Goyal introduced the Climate Adaptive Community-based Water Harvesting Project in Meghalaya. This initiative aims to enhance community livelihoods and reduce vulnerability in alignment with the Meghalaya State Water Policy 2019. He informed that the intended outcome is to foster climate-resilient water management for the well-being of local communities. Additionally, he shared insights from the Poverty and Social Analysis (PSA), offering a comprehensive overview of economic activities, resources, challenges, and opportunities for sustainable livelihood development within the region. The project's comprehensive agenda includes institutional capacity development, climate-resilient water harvesting systems, and demonstrable improvements in community livelihoods.

Shri. Shree Padre, Author and Community Level Water Expert, Kasargod (online)

Shri Shree Padre shared invaluable insights from Karnataka, showcasing local-level techniques for water conservation and drought-proofing. He showcased success stories from Karnataka, illustrating the effectiveness of traditional water conservation techniques such as Badugalu (bunds) and Maralu Mucchige (sand/pebble mulching). Particularly noteworthy was the inspiring narrative of three generations of Nagarals in Karnataka actively campaigning for drought-proofing. These stories exemplify the enduring commitment of local communities toward sustainable water management practices. Furthermore, he emphasised the importance of techniques like bunding and levelling, along with sand/pebble mulching, in mitigating the impacts of water scarcity and promoting agricultural resilience. His narrative highlighted the efficacy of community-driven initiatives such as sand/pebble mulching, bunding, and levelling in ensuring agricultural resilience.

Smti. Meda Aihun Khongjliw Superintendent, Department of Fisheries, Government of Meghalaya

Smti. Meda Aibun Khongjliw underscored the critical importance of fish sanctuaries in conserving aquatic biodiversity and promoting sustainable livelihoods. Through a video presentation, she emphasised the need for concerted efforts to prevent overexploitation and enhance the ecological resilience of aquatic ecosystems. Smti. Khingjliw provided a brief overview of Meghalaya, highlighting the number and significance of fish sanctuaries. Emphasising the rationale behind establishing these sanctuaries, she underscored the need to preserve aquatic biodiversity and prevent overexploitation of fish stocks. Additionally, she elaborated on the resources and potential of fisheries in Meghalaya, citing current fish production figures and anticipated outcomes under the Meghalaya State Aquaculture Mission (MSAM) 3.0.

In her discourse, she delved into the importance of fish sanctuaries, detailing site selection criteria and management strategies. She elucidated the project implementation process, outlining the challenges faced, including the varying span of river systems, the need for stock assessment studies, and the Fisheries Act which is yet to be put in place. Furthermore, she addressed the challenge of achieving attitudinal change in regions and communities not traditionally inclined towards fisheries, emphasising the importance of cultural sensitization and community engagement in sustainable fisheries management.

Dr. S.K. Das, Principal Scientist (Fisheries), Division of Animal and Fisheries Sciences, ICAR Research Complex for NEH Region

Dr. S. K. Das, through his presentation on "Sustainable Aquaculture in Mid Hill Region - Challenges and Opportunities", delved into the challenges and opportunities of sustainable aquaculture in the mid-hill region. He emphasised the critical factors influencing fish farming situations, including the quality of fish seeds and feeds, soil conditions such as pH levels and nutrient content, and considerations for pre-stocking and post-stocking management. Additionally, he highlighted the susceptibility of fish farming to various external factors such as diseases, floods, and droughts, underscoring the importance of timely access to high-quality fish seeds and affordable feeds.

Furthermore, he shed light on the escalating global challenge of water scarcity, with many countries prioritising efficient water management and recycling. He discussed the ramifications of changing weather patterns and extreme events, particularly on small-scale farmers and their families, emphasising the vulnerability of fishponds to water stress. Such stressors can impede fish growth and biomass production and potentially result in mass mortality events.

Moreover, he provided insights into fish and fish seed production in Northeast India, underlining the significance of this region in contributing to the aquaculture sector. His presentation underscored the multifaceted nature of sustainable aquaculture and the imperative for holistic approaches to address the complex challenges faced by fish farmers in the region. Highlighting the impending water stress and its ramifications on small-scale aquaculture, Dr. Das elucidated innovative technologies and integrated farming models for mitigating water-related risks and enhancing household livelihoods.

The session concluded with a collective commitment to fostering synergies between water management practices and livelihood enhancement initiatives, thereby paving the way for resilient and sustainable communities in Meghalaya and beyond.

*Scan the **QR Code** to watch the live video of the **Technical Session** - Water & Livelihoods*

TECHNICAL SESSION

Water, Gender & Equity

The session conducted a comprehensive review of the inclusivity of gender in diverse water initiatives, deliberating on strategies to enhance gendered participation and leadership within the specific context of hill regions. Attendees discussed the significance of improving gendered involvement and proposed actionable ways to achieve greater inclusivity and empowerment in water-related initiatives.

Moderator:

Shri. Biswanath Sinha, Director, Policy and Technical Support, WaterAid, New Delhi

Shri. Biswanath Sinha, extended a warm welcome to the esteemed panellists, acknowledging their diverse backgrounds ranging from implementation to policy formulation. He expressed anticipation for an engaging session enriched by the varied perspectives present. In conclusion, Sinha expressed gratitude for the opportunity to participate in such a significant session and expressed hope that the Government of Meghalaya would consider prolonging the discussion, recognizing its importance as a subject matter deserving of extended attention.

Dr. Indrani Phukan, Technical Adviser GIZ, New Delhi

Dr. Indrani Phukan, led the discussion that encompassed various activities undertaken by GIZ projects in the Northeastern region, emphasising the significance of gender equality as the equal participation of both men and women. She underscored that without the active involvement of men, women cannot attain the equality they aspire to achieve. GIZ, in its collaborative efforts with Indo-German bilateral cooperation projects, facilitated the formulation of the Meghalaya Water Policy and Nagaland, as well as piloted the Water Policy for the Jaintia Hills Autonomous District Council (JHADC), all of which incorporated gender participation. The organisation demonstrates a commitment to fostering women's participation by ensuring a 50% representation of women in its training programs. Notably, in the Sikkim Springshed management project, the inclusion of women in participatory planning yielded positive outcomes, sparking increased interest. Emphasising livelihood enhancement and alternative sources thereof to bolster community resilience, GIZ prioritises women-centric livelihoods.

Dr. Phukan explained further that through collaboration with the Sericulture Department in Meghalaya, GIZ introduced German technology to enhance Eri-silk production, proving more effective than traditional methods. Entrepreneurial training was provided for the utilisation of the 'Flying 8 Loom,' resulting in the emergence of Master trainers. GIZ upholds principles of social, economic, and political equality irrespective of gender, identity, orientation, race, or disability, with empowerment forming a cornerstone of its gender strategy. To realise empowerment, she said that GIZ adopts a transformative approach, addressing underlying barriers hindering women's progress.

She also said that the organization advocates for creating safe environments, with zero tolerance for sexual harassment and provisions for hygienic menstruation management. GIZ hosts gender competitions globally, recognizing projects and success stories that integrate gender perspectives or demonstrate significant female participation. Additionally, an innovative fund supports gender-inclusive projects and programs. With the motto "Gender Reloaded: Vision Needs Attitude – Attitude Meets Action," Dr. Phukan maintained that GIZ's new gender strategy aims to confront contemporary challenges in advancing equal opportunities and rights for all individuals, regardless of gender, sexual orientation, or identity. This aligns with the German Government's 2023 introduction of a feminist development policy, mandating gender as a primary objective in all cooperation projects. Such initiatives contribute to advancing gender equality, a pivotal component of sustainability and SDG 5.

To a query on how the organisation ensures women's active participation in training programs, Dr. Phukan replied that GIZ ensures women's active participation in training programs by implementing a policy whereby certificates are awarded only upon completion of the training. This approach allows GIZ to assess the effectiveness and impact of its training programs.

Another query pertained to the impact of GIZ's adopted gender policy, focusing on both objective and subjective aspects. To which Dr. Phukan said that GIZ emphasises the significance of monitoring and evaluation in assessing the effectiveness of gender strategies and incorporating necessary adaptations to accommodate new developments.

Shri. Prakash Singh, Director Pahal Uttarakhand

Shri. Prakash Singh highlighted a significant challenge faced by women, with approximately 90% of youth and male members migrating, leaving women to spend an average of 4-5 hours daily fetching water, often enduring long queues. Given the vital role of water in health and hygiene, efforts have been made to engage villagers in water management activities, including the formation of water committees where contributions are made in cash or kind. He further said that identification of sites located approximately 3 kilometres from the road, within forest areas, led to the development of Prahari in 2016, with 80% participation from women. Apart from that, he added that awareness programs were organised with the assistance of village youth, focusing on capacity building and skill development. Introducing ferro cement technology through collaboration with Water Aid India facilitated the construction of water harvesting structures, involving women in technology adoption, maintenance, and conservation efforts. Shri. Prakash Singh informed that this initiative has not only provided water for cultivation, thereby increasing household income, but has also led to improvements in nutrition, with evidence of 50% reduction in anaemia among women, despite initial reports indicating 84% prevalence. Furthermore, the organisation's endeavours were recognized with the 2nd National Award on Water Conservation for Best Village Panchayat in 2019.

To alleviate the burden of water-fetching, Shri. Prakash Singh emphasised that water sources should be brought within 100 metres of households, reducing drudgery. Additionally, recommendations were made to involve women in development activities, including participatory rural appraisal (PRA) to map water sources and identify spring sites within villages. He added that setting a goal of achieving 80% participation and leadership of women aims to ensure effective water management and gender inclusivity in decision-making processes.

Smt. Hasina Kharbhih, Impulse NGO Network , Shillong

Smt. Hasina Kharbhih highlighted the fact that equity attainment remains elusive in project-based initiatives, yet, from an innovation perspective, it can be fostered inclusively by consolidating resources under a unified framework. The Impulse model, a comprehensive framework comprising 12 pillars, garnered acclaim with the prestigious World Innovation Prize in 2012, underscoring its global significance. She explained that innovation, as a catalyst, transcends geographical boundaries; however, the impactful dimension lies in scaling out solutions, especially pertinent amid transnational mobility where vulnerabilities to exploitation are pronounced. Displacement, triggered by diverse factors such as disasters, climate exigencies, or economic pursuits, underscores the imperative of addressing root causes. Smt. Kharbhih further said that Impulse's footprint across 1200 acres within the northeast India exemplifies its transformative impact, notably in engendering inclusivity, a feat duly recognized through commendations. Notably, within the Indo-Myanmar border region encompassing Mizoram, Manipur, and Nagaland, where agroforestry initiatives mitigate deforestation risks precipitated by resource scarcity-induced migration. She added that collaboration with local communities underscores a participatory ethos, essential for sustainable development endeavours. Leveraging technological innovations like the Qobo app, Impulse facilitates gender-responsive interventions, albeit recognizing persisting gender disparities, particularly in labour distribution during mobility contexts.

Furthermore, Kum. Kharbhih said that Impulse's ethos prioritises dialogue engagement, recognizing cultural nuances that shape gender dynamics, upholding the ethos of equity necessitates navigating socio-cultural barriers entrenched within matrilineal societies. Meghalaya's cultural fabric, though characterised by gender parity in familial roles, underscores the need to reconcile traditional norms with contemporary aspirations for gender-inclusive decision-making structures, embracing cultural heritage while fostering gender parity underscores the imperative of collaborative endeavours.

In the broader context, Kum. Kharbhih explained that the Northeast's rich tapestry of indigenous cultures presents an opportunity to harness traditional wisdom synergistically with modern innovations, thereby empowering women in sustainable development paradigms. Initiatives like Impulse Social Enterprises and partnerships with global entities like Meta exemplify concerted efforts towards gender-inclusive development, addressing socio-cultural impediments while amplifying indigenous voices in the discourse on climate resilience.

In response to a query concerning socio-cultural obstacles faced by women and underrepresented genders in Northeast India, she said that the nuanced interplay between tradition and contemporary aspirations emerges as a defining factor. While matrilineal systems are emblematic of egalitarian familial structures, they necessitate a recalibration of decision-making frameworks to ensure equitable participation. She also said that cultivating a narrative that acknowledges cultural legacies while embracing progressive gender norms fosters a more inclusive developmental trajectory, thereby harnessing the untapped potential of Northeast India's diverse populace.

Prof. Sukalpa Bhattacharjee, Department of English NEHU

In the analysis of any societal issue, Prof. Sukalpa Bhattarcharjee explained that one's positionality holds significance, delineating the trajectory of discourse and action. She, being an academic entrenched in gender studies within the educational realm, particularly in the domain of water management, underscored the imperative of a sociological framework in understanding the intricate interplay of gender, equity, and water resources. Absent a robust conceptual foundation, discernible lacunae emerge, manifesting as gender disparities, policy inefficacies, and implementation hurdles. Hence, the symbiotic relationship between policymakers and critical academics, poised to identify and rectify systemic gaps, assumes paramount importance.

Prof. Bhattacharjee maintained that the transformation of water from a natural resource to a commodified entity signifies a profound paradigm shift, invariably precipitating contestations among diverse stakeholders. The ensuing discourse on gender, albeit typically framed within heteronormative binaries, inadvertently marginalises transgender and LGBTQ+ communities, thus perpetuating exclusionary dynamics. She further shared that the evolution of national water policies, spanning the iterations of 1987, 2002, and 2012, underscores a gradual yet incomplete recognition of gender dynamics, culminating in the explicit acknowledgement of women's participation in the latest iteration.

Noteworthy initiatives as Prof. Bhattacharjee explained, such as the grassroots endeavours in the Amsoi region bordering Karbi Anglong and Nagaland's stream revitalization projects, epitomise proactive community-driven solutions within the broader framework of the Jal Jeevan Mission (JJM). However, persisting challenges, exemplified by menstrual hygiene disparities in Meghalaya's rural hinterlands, underscore the imperative of holistic policy interventions. In the Northeastern context, wherein women's lives are intrinsically intertwined with riverine ecosystems, the glaring absence of female voices in policy deliberations necessitates urgent redressal.

Responding to a query on exploration of alternate institutes to improve water policy initiatives, Prof. Bhattacharjee replied that alternative institutional mechanisms, exemplified by Self-Help Groups (SHGs) and traditional knowledge systems embodied in the concept of "Jalsaheli," offer promising avenues for equitable water governance. The convergence of gender equity imperatives with ecological stewardship, epitomised by the right-to-nature ethos, underscores the interconnectedness of gender rights, ecological sustainability, and human dignity. Transgender-inclusive policies, exemplified by the provision of gender-sensitive sanitation facilities, epitomise transformative strides towards inclusivity within water governance frameworks.

Prof. Bhattacharjee further said that moving beyond episodic project-based interventions towards sustained systemic transformations necessitates the scaling up of proven innovations and the institutionalisation of equitable practices. By transcending the short-termism inherent in project-centric approaches, stakeholders can collectively engender enduring developmental outcomes aligned with the ivmperatives of gender equity and environmental sustainability.

*Scan the **QR Code** to watch the live video of the **Technical Session -** Water, Gender and Equity*

TECHNICAL SESSION

Online Talks on Hill Systems

The session presented insights from national-level experts, who provided valuable perspectives on the intersection of water and health systems across diverse themes. Attendees gained valuable reflections on the critical linkages between water management and public health from these esteemed speakers. Notably, this session differed in that all experts delivered their talks online to the attendees of the conclave, as they were not physically present at the venue.

Moderator:

Smti. Isawanda Laloo, IAS, Secretary, Agriculture, Government of Meghalaya

Plenary session titled "Online Talks on Hills Systems" moderated by Smt. Isawanda Laloo, Secretary to the Government of Meghalaya, Department of Agriculture and Farmers Welfare, delved into the intricacies of water management within hill ecosystems, particularly pertinent in the face of increasing vulnerability due to climate change. Highlighting the indispensable role of water as a critical resource, the discussion emphasizes the imperative of holistic and sustainable management practices.

In the context of rural livelihoods heavily reliant on natural resources, achieving a delicate balance between burgeoning population demands and preserving ecological integrity emerges as a pressing concern. The session underscores the crucial need for enhancing water availability without compromising the integrity of natural ecosystems.

Addressing the multifaceted dynamics, the session seeks to explore strategies for fostering consensus among government bodies, institutions, and local communities on sustainable and equitable water usage. Special attention is paid to tribal communities like those in Meghalaya, underscoring their intrinsic relationship with the natural environment.

Shri. R.M Mishra, IAS (Retd.)

Shri. R.M. Mishra addressed the array of challenges pervasive in hilly terrains, ranging from biodiversity and environmental concerns to socio-economic and cultural factors, policy, governance, deforestation, and climate change's impact on land use. He advocated for a holistic approach that integrates traditional wisdom with contemporary technology, community involvement, and robust governance mechanisms. Shri. Mishra emphasised diagnostic solutions for enhanced governance and efficiency, including groundwater and aquifer assessments and sustained efforts towards spring rejuvenation. He further suggested point-based sustainable solutions, such as integrating rainwater harvesting (RWH) models into urban building by-laws, promoting initiatives like Catch the Drop Rainwater Harvesting, adopting Emerging Water Technologies like Moisture to Water and Greywater Treatment, modernising Zabo Farming practices, and expanding rainwater harvesting and storage facilities. He emphasised the importance of ecosystem management, improvements in health, hygiene, and sanitation, fostering social and cultural activities, advancing education, and bolstering sustainable livelihoods as the way forward.

Dr. Muralee Thummarukudy, Water and Climate Adaptation Specialist, UNEP

Dr. Thummarukudy provided insights into water management within the context of climate change, particularly in hilly regions. He highlighted the accelerated pace of rainfall in these areas, leading to heightened risks of landslides, floods, droughts, and water scarcity. Dr. Thummarukudy underscored the magnifying effect of climate change on existing disasters and warned of the potential for water-related conflicts in the future, exacerbated by rural-urban migration in water-stressed areas. He referenced the G20's recognition of land degradation as a pressing issue and emphasised the importance of sharing global best practices to address these challenges while stressing the need to enhance people's capacity to understand and respond to climate change.

Prof. N.C. Narayan, Head, Ashank Desai Centre for Policy Studies, IIT Bombay

Prof. Narayan presented on the theme "Immersive Learning & Local Action for WatSan: Living Lab Alleppey," showcasing a short documentary on how the Chathanadu colony uplifted itself without relying on heavy machinery. He highlighted the pollution issues plaguing Umiam Lake and the prevalent reliance on centralised sewage treatment plants, which pose significant financial challenges. Proposing sustainable alternatives such as small-scale sewage treatment units, Prof. Narayan stressed the importance of comprehensive data collection efforts and the development of sanitation zones for effective urban planning. He also provided insights into the initiatives undertaken by Living Lab Alleppey, including CANALPY, Urban Loop, and the Technology and Governance Support Group, aimed at fostering community engagement and designing municipal interventions to address environmental challenges.

*Scan the **QR Code** to watch the live video of the*
***Technical Session -** Online talks on Hill Systems*

TECHNICAL SESSION

Water Quality, Communities and Governance

The session provided a platform for extensive deliberations on key issues surrounding water quality, community participation, and participatory governance of water systems in hill regions. Participants engaged in in-depth discussions aimed at understanding the challenges and opportunities in these areas and collectively brainstormed strategies to address them. Through collaborative dialogue and knowledge sharing, the session aimed to identify effective approaches and initiatives to further strengthen water quality management, enhance community engagement, and promote participatory governance within hilly terrains.

Moderator:

Shri. V. R. Raman, Executive Director, CBGA

Mr. V. R. Raman introduced each panellist, highlighting their respective initiatives and expertise in integrating water management with community engagement, alongside diverse facets of water resource management. Notably, Meghalaya shares borders with neighbouring countries, raising concerns about potential water conflicts and the imperative for community-driven water governance frameworks.

Delving into the extensive experience of the panellists in ensuring water quality from grassroots levels, the moderator emphasised their invaluable contributions.He also proposed a structured approach, initially addressing water quality issues followed by governance and institutional aspects. Emphasising the criticality of ecologically sustainable practices, the moderator underscored the interconnectedness of sanitation and water quality, stressing the need for urgent attention to sanitation concerns.

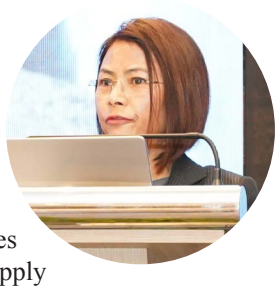
Smt. Jennifer Sawian, Senior Scientist, Meghalaya Pollution Control Board

Speaking on "Water, Quality, Communities and Governance", Smt. Jennifer Sawian, meticulously delineated the functions and activities governed by the Water (Prevention and Control of Pollution) Act, 1974. This encompassed comprehensive monitoring of water quality through the National Water Monitoring Programme (NWMP), including the surveillance of effluent and wastewater discharged from industrial units.

Notably, the Board conducts rigorous water quality assessments across 25 rivers at 67 distinct locations within the state, with resulting data submission to the Central Pollution Control Board (CPCB). Smt. Sawian further said that the CPCB has identified 7 polluted stretches, each prioritised based on varying levels of Bio-Chemical Oxygen Demand. Initiatives to rejuvenate and enhance water quality in Shillong, including household inspections, were also highlighted.

The envisioned path forward, as Smt. Sawain maintained, entails the implementation of extensive awareness programs, the erection of additional chain link fencing in vulnerable areas, enforcement actions against violators under the polluter-pays principle, and continued inventorying of water-polluting units.

Smti. Badarisha Lyndem, Chief Engineer of the PHE Department, Meghalaya



While addressing the topic of "Drinking Water Quality," Smti. Badarisha Lyndem emphasised the stance of the Government of Meghalaya on assessing drinking water quality and advocating for universal access to safe drinking water and sanitation, in line with Sustainable Development Goals (SDGs) 3, 5, 8, and 13. The department's vision emphasises the commitment to providing every individual with sufficient safe water for various domestic needs sustainably. An overview of Government of India (GOI) initiatives aimed at supplying drinking water to rural areas, such as the Accelerated Rural Water Supply Programme (ARWSP), National Rural Drinking Water Programme (NRDWP), and Jal Jeevan Mission (JJM) since 2019, was provided.

Smt. Lyndem outlined the key steps essential for ensuring water safety, including source identification, inspection, collection of raw water samples, laboratory testing, and the selection of appropriate treatment processes. She highlighted the significance of the Water Quality Management Information System (WQMIS), which facilitates universal access to water quality reports. Emphasising the paramount importance of preserving water sources, the presentation underscored the importance of prevention rather than restoration post-contamination. The vision of the Jal Jeevan Mission (JJM) includes ensuring adequate drinking water supply to every rural household, supported by ongoing monitoring and surveillance mechanisms. Additionally, she discussed urban water supply initiatives, such as the Greater Shillong Water Supply (GSWS) Project, which involves pumping water from the River Umiew in two stages, with daily monitoring conducted at the in-house treatment plant.

As a proposed approach to ensure safe drinking water, Smt. Lyndem mentioned the importance of providing access to water quality information through the Citizen Corner of the JJM Dashboard. Furthermore, citizens can directly lodge complaints through the web-based application, the Meghalaya Public Grievance Redressal and Monitoring System (MegPGRAMS), which is designed for grievance resolution and monitoring around the clock.

Smt. Sharmila Kakoty & Smt. Sumanjita Barman, INREM Foundation Initiative

Speaking about "Experiences in Managing Water Quality Problems," Smt. Sharmila Kakoty and Smt. Sumanjita Barman shared insights from INREM Foundation's endeavors in addressing water quality issues and highlighted success stories from communities. The duo passionately described the visionary mission of the INREM Foundation, which focuses on cultivating water-safe communities and outlined the geographical scope of their operations. Their overarching objective is to create a future where every rural area in India has access to clean and secure water sources, thereby safeguarding the health, well-being, and sustainable livelihoods of millions. Geographically, their efforts extend across 10 districts spanning 7 states, where they collaborate closely with local communities to address water quality concerns effectively.

At the core of the organization are its fundamental principles, embodied by the concept of "Amplify the Agency," as emphasized by Smt. Barman. This principle underscores their dedication to enhancing the capacity of individuals and communities to independently address water quality challenges. They accomplish this by establishing partnerships with governmental bodies and civil society organizations, expanding problem-solving capabilities beyond geographical constraints. The duo further explained that the INREM Foundation strives to empower communities with actionable information, equipping local service providers and citizen groups with the knowledge required for effective intervention.

They also said that central to their mission is the imperative to combat the perils posed by contaminants such as fluoride, arsenic, nitrate, and other chemicals in drinking water, which threaten public health with conditions like fluorosis, etc. They further elaborated that INREM's multifaceted approach to mitigating water quality issues encompasses rigorous assessment and research, proactive mitigation and adaptation strategies, the integration of crowdsourced and public data to pinpoint hotspots, and the establishment of village-level institutions. These efforts are further bolstered by a commitment to mainstreaming initiatives within local programs.

The duo emphasized that the network's operational framework encompasses the development of Water Quality Management (WQM) courses tailored to the specific needs of each NGO network, facilitating the dissemination and scaling of implementation efforts and fostering collaborative learning groups to tackle field challenges. Platforms such as iECHO, GLific, and Ooloi OKF serve as vital conduits for sustaining these collaborative endeavors and fostering interconnectivity.

Illustrating the efficacy of their solutions, Smt. Barman said that a case study from Assam highlights how frontline workers, water user committees, and students are empowered to effect transformative change within their communities. This initiative underscores a paradigm shift towards community empowerment, particularly through student engagement. She also said that the model of the People-Centric District Water Quality Platform (One way of Governing Water Quality Issues) was initiated in different districts across the country. The role of the platform is to connect the needs of the affected communities, enabling convergence and periodic monitoring of the status of water quality and health impacts.

As a way forward, Smt. Barman said that INREM Foundation aims to forge joint efforts with JJM Assam to redouble their efforts in addressing water quality challenges and fortifying rural WASH initiatives, thereby advancing the cause of water security and public health in Assam and beyond.

Shri. Eklavya Prasad, Managing Trustee, Megh Pyne Abhiyan

Shri. Eklavya Prasad delivered a presentation titled "Water Quality, Community, and Governance – Insights from Bihar and Jharkhand," outlining a visionary approach aimed at comprehending groundwater dynamics at a local level, particularly vital in Bihar where it serves as the primary water source. The vision entails collectively interpreting groundwater quality and shifting the discourse on safe drinking water from an individual to a collective responsibility. He stretched this fact by adding that lessons gleaned from establishing a narrative of scarcity and conducting various studies culminated in the development of a functional collaborative framework, facilitating diverse perspectives to address water-related challenges and effectively engage communities. This framework encompasses a drinking water protocol, mechanisms for source and resource sharing, advocacy for 38 safe drinking water, and involvement in its protection, alongside initiatives for ecologically sustainable and disaster-resilient sanitation systems.

Shri. Prasad further said that a specialised methodology has been devised for identifying and empowering "Bhujal Doots" (groundwater messengers), further augmenting community engagement and participatory processes centred around groundwater management.

Post-presentation, a question-and-answer session delved into the realm of sanitation, particularly urban treatment plans in India. The response emphasised the imperative of combating disaster-prone areas and floods, exemplified by the case of North Bihar, which faces a myriad of flood challenges. It underscored the criticality of adaptable sanitation strategies tailored to flood-prone regions to safeguard groundwater resources, emphasising the sustainability imperative in the face of environmental challenges.

Shri. KJ Joy, Managing Trustee, SOPPECOM

In his discussion on "Water Governance", Shri. K.J. Joy delved into analysing the institutional structures and innovative approaches pertaining to water management. He emphasised the example of Hivre Bazar, where conventional practices prioritise water-efficient methods over bore wells for irrigation, coupled with detailed water usage planning synchronised with availability. Furthermore, he showcased transformative initiatives in Atpadi district, Maharashtra, where a public irrigation system underwent restructuring to incorporate water sources, guarantee equitable distribution, and delegate management responsibilities to Water Users' Associations. Delving into the concept of water governance as a linchpin for addressing entrenched water crises, reference was made to Rogers and Hall's assertion regarding the multifaceted systems encompassing political, social, economic, and administrative dimensions that shape water resource development and service delivery. He further placed the emphasis on transcending the traditional 'good governance' discourse, which often revolves around accountability, transparency and participation, to incorporate considerations of the physical and technological facets of water organisation, including formal institutions.

Shri. Joy also elucidated the three overarching dimensions of water governance: the allocative function, governing norms of water access and pricing; the management function, entailing water resource development, distribution, and system maintenance; and the regulatory function, marked by the emergence of independent regulatory bodies to oversee water management.

He further underscored the key issues pertaining to water governance, emphasising the imperative to foster integration, sustainability, equity, efficiency and participation in restructuring the water sector. He also said that addressing water conflicts within the country was identified as a critical challenge, alongside the necessity of establishing democratic, legally mandated institutional frameworks at various scales to facilitate public participation, data sharing, and negotiation.

*Scan the **QR Code** to watch the live video of the*
***Technical Session -** Water Quality, Communities & Governance*

TECHNICAL SESSION

Rivers & Water Systems

The session provided a comprehensive exploration of the critical necessity and existing conditions surrounding the protection and rejuvenation of rivers and other water bodies in hill regions. Through thorough discussions and exchange of ideas, participants examined the challenges faced in preserving these vital water resources and brainstormed innovative approaches to strengthen conservation efforts. Emphasising the significance of sustainable management practices, the session aimed to develop a roadmap for bolstering initiatives aimed at safeguarding and revitalising water bodies within hilly terrains, thereby ensuring their long-term health and resilience.

Moderator:

Shri. Vivek Singh Grewal, Senior Hydrologist, WELL Labs, Bengaluru

Setting the context on the Rivers and Water Systems, Shri. Vivek Singh Grwal emphasised the interconnectedness of water systems, with rivers serving as the embodiment of this complexity. He highlighted significant issues facing India's rivers, citing studies by Abhijit Mukherjee Paper in Nature (2017) and Vimal Mishra's paper in Nature (2023) that underscored the urgent need to address declining base flows. Drawing on system theories, he emphasised the importance of understanding stocks and flows and navigating feedback loops when formulating solutions. He pointed to adaptive systems, such as local governance, as key to resilience in water management. He also acknowledged the bounded rationality inherent in water systems, advocating for overarching rules to guide collective action. In conclusion, he urged participants to prioritise sustainable solutions that safeguard both ecosystems and communities.

Dr. PS Rao, Director, Advanced Centre for Integrated Water Resources Management (ACIWRM), Govt of Karnataka

Dr. P.S. Rao, in his presentation "Rivers & Water Systems- River Basin Planning in Karnataka", delivered an insightful talk focusing on the challenges and strategies related to water resources management in Karnataka and beyond. He commenced his address by highlighting the critical importance of integrated water resource management in addressing the multifaceted challenges posed by water scarcity, pollution, and climate change. He emphasised the need for a holistic approach that considers not only the quantity but also the quality and sustainability of water resources.

One of the key points discussed by Dr. Rao was the significance of stakeholder engagement and participatory approaches in water management. He stressed the importance of involving local communities, government agencies, NGOs and other relevant stakeholders in decision-making processes related to water resource allocation, conservation and management. Dr. Rao emphasised the need for collaboration and synergy among different sectors and stakeholders to achieve sustainable water management goals.

Another important aspect of Dr. Rao's talk was the adoption of innovative technologies and practices for efficient water resource management. He discussed various technological solutions such as remote sensing, GIS (Geographic Information System), and IoT (Internet of Things) that can aid in monitoring and managing water resources effectively. Additionally, Dr. Rao highlighted the importance of promoting water-saving technologies and practices in agriculture, industries, and urban areas to optimise water use and minimise wastage.

Furthermore, Dr. Rao addressed the issue of water governance and policy frameworks. He emphasised the need for robust water governance structures and policies that are inclusive, transparent, and responsive to the needs of different stakeholders. Dr. Rao advocated for the adoption of integrated water resource management principles in policy formulation and implementation to ensure sustainable and equitable use of water resources.

Smti. Saw Sanda Win, Deputy Director, Ministry of Transport and Communication, Myanmar

Smti. Saw Sanda Win, while talking about "National Water Resources Utilisation and Management of Myanmar" highlighted the formation of the National Water Resources Committee stating that it was formed in July 2013 with the main purpose to manage water resources efficiently and effectively. NWRC is an apex body in the water sector in the country. She also mentioned that the NWRC is working for Integrated Water Resources Management (IWRM) for successful management and systematic utilisation of all water resources as well as water governance. NWRC has also come up with the National Water Policy, IWRMS, Water Framework Directive, Myanmar Drinking Water Quality Standard. She also said that their country also implemented the Ayeyarwady integrated River Basin Management Project which is 100 million USD project funded by World Bank, to strengthen integrated, climate resilient management, to develop the institutions and tools needed to implement integrated river basin management and to deliver related livelihoods benefits from enhanced navigation and hydromet warning and advisory services.

Shri. Deepak Singh Bisht, Scientist 'C', NIH, Roorkee

In his presentation on "Rivers and Water Systems: Challenges and Solutions," Shri. Deepak Singh Bisht emphasised the crucial need to adopt a systematic, coordinated, and scientifically grounded approach to managing rivers and water systems, aligning with the seven United Nations Sustainable Development Goals (SDGs). These goals encompass poverty eradication, hunger alleviation, gender equality, access to clean water and sanitation, sustainable urban development, climate change mitigation, and terrestrial ecosystem preservation, all of which are deeply intertwined with water resource management. He emphasised that at the core of this effort lies hydrology, an interdisciplinary science focused on water movement. Recent advancements in hydrological knowledge, particularly over the past two decades, have led to the development of more comprehensive models and diagrams elucidating the complexities of the water cycle, including its various components.

Shri. Bisht also remarked that the nexus between climate change and water systems is profound, as evidenced by the interconnections between atmospheric, biospheric, and hydro spheric processes. He said that rising atmospheric temperatures due to greenhouse gas emissions have accelerated glacial melt, altering precipitation patterns globally. Notably, the Intergovernmental Panel on Climate Change (IPCC) has highlighted the significant human contribution to climate change, with regions such as India, Pakistan, and Bhutan experiencing heightened precipitation levels attributable to anthropogenic factors.

In the context of river and water system management, Shri. Bisht said that projected changes in climatic extremes, such as increased mean precipitation, river floods, and extreme precipitation events, pose significant challenges. These challenges are exacerbated with each increment of global warming, leading to higher flood risks and altering drought patterns. He added that it is projected that India may face more frequent and severe droughts in a warmer climate, necessitating comprehensive strategies to mitigate adverse impacts.

Furthermore, he said that the interdependence between upstream and downstream regions underscores the need for collaborative and sustainable management approaches. Groundwater depletion in upstream areas poses challenges for downstream communities, necessitating integrated strategies that address both challenges and benefits comprehensively.

Shri. Bisht further explained that the Driving Forces-Pressures-State-Impact-Response (DPSIR) framework provides a structured approach to managing rivers and water systems, addressing drivers such as organisational practices, agriculture and climate change variability. However, challenges such as inadequate data quality, climate change mitigation, and workforce training persist. Nevertheless, opportunities such as public awareness campaigns, capacity-building initiatives and government support present avenues for progress.

He further added that efforts to address climate change impacts on ecosystems must acknowledge human influences on weather and climate extremes, with projected changes becoming more pronounced with each degree of global warming. Regional collaborative projects, policy dialogues and institutional capacity-building initiatives hold promise for achieving the SDGs outlined by the United Nations.

Shri. Shajatnan KH, Director (Technical) National Water Development Agency, New Delhi

Shri. Shajatnan KH, while speaking on "Rivers & Water Systems - River Basin Planning in Kerala" articulated that water basins transcend political boundaries, serving as interconnected entities among states and countries. He emphasised the imperative of addressing the intricate socio-economic and political facets to bolster hills' resilience and water conservation efforts. He cited the Government of Kerala's proactive approach, implementing eco-restoration initiatives and promoting sustainable livelihoods, particularly among indigenous communities, through participatory resource management methodologies.

Furthermore, Shri. Shajatnan underscored the significance of interventions in forest areas, necessitating robust monitoring mechanisms. To address this challenge, the formation of Joint Forest Management Committees (JFMCs) facilitated high levels of community participation. He also highlighted watershed management strategies, emphasising the subdivision of watersheds into micro-watersheds, each governed by a corresponding community institution. The proposed treatments, synthesised through community input and scientific expertise, integrated traditional knowledge, proving effective in forest cover regeneration.

In advocating for people-centric approaches, Shri. Shajatnan emphasised the importance of public participation in ensuring transparent and corruption-free governance. Notably, the rejuvenation of major substreams exemplified the success of hills' treatment as pivotal to river health and vitality. Looking ahead, he advocated for consensus-building between states, legal reforms to facilitate Interlinking of Rivers (ILR) projects, incentivizing donor states, engaging neighbouring countries in dialogue, and prioritising mass awareness campaigns.

Responding to concerns regarding groundwater depletion, Shri. Shajatnan acknowledged climate change's exacerbating effects on the Ganges and outlined the Ministry of Jal Shakti's interventions under the MGNREGA scheme for water management. Despite challenges, he reassured that replenishment efforts, particularly in the upper Ganga region, are underway.

Addressing concerns about declining irrigation potential, Shri. Shajatnan stressed the importance of water control and management. He highlighted the installation of gates and cross regulators to efficiently manage water distribution, bridging gaps in irrigation coverage. Additionally, he advocated for interlinking rivers as a viable solution to address water scarcity and optimise resource utilisation.

In essence, Shajatnan's insights underscored the multifaceted nature of water resource management, advocating for collaborative, community-driven approaches to address challenges and ensure sustainable water security for future generations.

*Scan the **QR Code** to watch the live video of the **Technical Session** - Rivers & Water Systems*

PLENARY SESSION

Way Forward for Action on Water in Hill Regions from different parallel sessions

Chair:
Shri A. Razi,
IRTS Commissioner and Secretary,
Govt. of Meghalaya

Co-Chair:
Shri. Joram Beda, IAS,
Commissioner & Secretary,
Govt. of Meghalaya

Moderator:

Shri. V.R. Raman, Executive Director, CBGA, New Delhi

As the session moderator, Shri. V.R. Raman outlined the objective, which aimed to consolidate discussions from various sessions conducted on 9th and 10th February. The goal was to ensure that all participants comprehensively understood the topics discussed and the outcomes achieved. Emphasis was placed on identifying key takeaways from each session, particularly regarding the advancement of hill regions. Senior state officials responsible for drinking water, water resources, and climate components would carefully consider the recommendations presented. They would reflect on how these recommendations align with existing programs, missions, and initiatives undertaken by the state. Additionally, discussions would revolve around exploring avenues for incorporating these recommendations into actionable strategies, technological innovations, and learning processes.

Way forward from the session on Best Practices on Water Conservation by Shri. Eklavya Prasad, Managing Trustee, Megh Pyne Abhiyan

As the moderator of the session on Best Practices on Water Conservation, Shri. Eklavya Prasad, shared insights and key takeaways from the discussions. These key points underscored the importance of adopting integrated approaches, leveraging traditional knowledge, and fostering collaborative efforts to address water conservation challenges effectively. Here are the way forward highlighted:

i. Integrated Water Management Approach: Emphasizing an integrated water management approach coupled with decentralized water governance frameworks, including the involvement of autonomous councils, is crucial for effective water conservation and management.
ii. Effective Utilization of Flood Water: There is a need to focus on effectively utilizing floodwater to mitigate water scarcity and promote sustainable water management practices, especially in flood-prone regions.
iii. Addressing Water Quality Challenges: It is essential to identify water quality hotspots and develop collective responses to address water quality challenges through governance mechanisms and community frameworks.
iv. Mapping Traditional Water Systems: Mapping and revitalizing waning traditional water systems, technologies, and local lived experiences can contribute to sustainable water management and conservation efforts.
v. Community and Climate Ecosystem-Based Interventions: Implementing community and climate ecosystem-based water management interventions can enhance resilience to climate change and promote sustainable water use practices.

vi. Modernizing Traditional Water Management Systems: Modernizing traditional water management systems while respecting indigenous knowledge and practices can improve efficiency and effectiveness in water conservation and management.
vii. Harmonious Collaborations: Foster harmonious collaborations among various stakeholders for water-based interventions, including government agencies, NGOs, communities, and private sectors, to maximize impact and ensure inclusive decision-making processes.

Way forward from the Climate, Water and Disaster session by Shri. Saransh Bajpai, Associate Director, Climate, WRI, New Delhi

Summarising the session on Climate, Water, and Disasters, Shri. Saransh Bajpai emphasised two primary themes: Firstly, the challenges, planning, and implementation required to foster resilience in economic sectors, particularly regarding water resources; and secondly, the essential components necessary for establishing an integrated and comprehensive approach. To achieve these objectives, several pivotal elements were outlined:

i. Data-informed analysis and assessments are pivotal, necessitating partnerships with technical institutions, think tanks, and research organisations to conduct scientific evaluations. Given the scarcity of data in many environments, robust data management practices are indispensable to ensure accessibility for all stakeholders.
ii. Inclusive planning is imperative, utilising analyses and assessments to inform policy-making while ensuring the integration of inclusivity principles across all levels - processes, policies, and impacts.
iii. Effective and integrated implementation is vital, requiring the establishment of necessary mandates and resource allocation to enhance understanding of risks in planning processes and disaster management plans.
iv. Robust monitoring, evaluation, and learning mechanisms are required, identifying indicators to gauge implementation effectiveness, including qualitative parameters to capture social equity and gender aspects.
v. Transformative governance mechanisms and associated reforms are imperative, adopting a comprehensive approach to dismantle silos and enhance coordination and cooperation. These efforts should be supported by means of implementation such as capacity building, awareness, technology, and finance.

Way forward from the Spring shed Development session by Shri. Abhishek Likam, Head Springshed Management, CHIRAG, Uttarakhand

Shri. Abhishek Likam, while briefly summarising the discussion on Springshed Management, emphasised the paramount importance of revitalising rivers and large water bodies, with unanimous consensus on the foundational role of springshed management in this endeavour. He highlighted several actionable items that emerged from the deliberations:

i. Acknowledgment of the extensive inventories and data amassed to identify critical springs was noted, emphasising the need to leverage this information to understand vulnerabilities, socio-economic dependencies, and cultural dimensions within communities. The collection of such data is crucial for shaping narratives surrounding the urgency of springshed conservation.
ii. There was a focus on facilitating access to data through suitable formats and technologies, empowering communities, enhancing their capacities, and allocating funds while incentivizing crucial aspects across all springshed management initiatives. Additionally, resources such as proficient personnel and para-hydrogeologists, alongside Village Conservation Funds (VCFs), must be replicated across springsheds.

Encouraging informed decision-making grounded in collected data was emphasised, along with fostering collaboration between departments and projects targeting water access, quality enhancement, and distribution. Finally, there was a call for a streamlined fund flow mechanism to effectively support these initiatives.

Way forward from the Water, Gender & Equity session by Shri. Bishwanath Sinha, Director Policy and Technical support, Water Air, New Delhi

As the Moderator of the Plenary Session on "Water, Gender & Equity," Shri. Bishvanath Sinha emphasised the collective understanding that emerged from the discussion. He underscored the urgent need to prioritise gender and equity considerations as interlinked yet distinct elements. Moving forward, he emphasised that it is crucial to recognize that grasping gender-sensitive policies and initiatives is paramount. This understanding will not only bolster women's involvement and resilience but also alleviate burdens and foster inclusivity across pivotal sectors. Gender inclusivity must be woven into the fabric of project planning, execution, and ongoing monitoring. It's essential to acknowledge that these efforts cannot operate in silos; a comprehensive approach is indispensable and should be integrated into relevant agencies. Moreover, there's a unanimous call for the establishment of a dedicated agency tasked with promoting gender inclusivity and challenging prevailing stereotypes.

Way forward from the Source Sustainability session by Shri. Asad Umar, Aga Khan Development Network, New Delhi

Shri. Asad Umat, chaired the Session Source Sustainability as Moderator and he emphasised upon the critical importance of safeguarding fragile ecosystems and responsibly managing water resources to ensure sustainability. He said that the Department of Public Health Engineering (PHE) has underscored that beyond the mere establishment of water supply structures, the management of spring sheds and the promotion of awareness regarding recharge mechanisms are essential for securing water for both current and future needs. Prioritising water resource management is paramount, and academic and research institutions can significantly contribute through action research aimed at empowering both institutions and communities to adopt water conservation practices. Technology, coupled with the empowerment of local institutions, can effectively address various water-related challenges.

Shri Umat also stated that via the presentations and the discussions, The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) was identified as a potential catalyst in water conservation efforts, facilitated by participatory planning, the empowerment of local institutions, and equitable water distribution. He further said that the session further underscored the significance of source sustainability and protection within the Jal Jeevan Mission, emphasising the utilisation of advanced tools such as remote sensing and GIS to achieve this objective. It was emphasised that traditional sources such as springs and streams must be preserved to ensure a continuous and dependable water supply.

Way forward from the Water and Infrastructure Development session by Shri. P.M. Scott, Member, RM, Central Water Authority, New Delhi

Shri P.M. Scott highlighted several key points from the session on Water and Infrastructure Development:

1. Emphasising the abundant untapped water resources in hilly states, there's a call to explore promising sites to boost storage capacity for various needs like drinking water, irrigation, industry, and hydroelectric power generation. Additionally, projects like Umiam Umtru in Meghalaya exemplify the role of intra-basin water transfer in efficient resource management.
2. Addressing the rising threat of extreme weather events, it's essential for water-related infrastructure design to incorporate resilience to such occurrences and disasters. Hydropower projects in hilly states are highlighted for their lower susceptibility to climate change.
3. There's a recommendation to enhance water quality monitoring infrastructure with technical assistance from the Government of India. Capacity building through institutions like the National Water Academy in Pune and others is also advised.
4. Strict adherence to dam safety measures, as outlined in the National Dam Safety Act, is crucial. This is particularly pertinent for dams such as Mawphlang in Meghalaya.

In summary, the way forward involves exploring untapped water resources, integrating resilience into infrastructure design, promoting hydropower projects, enhancing water quality monitoring infrastructure, and ensuring strict adherence to dam safety measures.

Way forward from Rivers and Water System session by Shri. Vivek Grewal, Senior Hydrologist, WELL Labs, Bengaluru

Looking forward from the session on Rivers and Water Systems, Shri. Vivek Grewal highlighted practical recommendations that stress the interconnected nature of water systems. It's crucial to perceive them holistically rather than as isolated elements. The responsibility for adopting this comprehensive approach lies with scientists and government agencies.

Rivers play a pivotal role in water systems by fostering connectivity among various components. This underscores the importance of river basin management agencies for integrated management. Empowering watershed or basin-based agencies is essential to foster this integration.

Despite challenges in modelling due to data limitations, enhancing data collection holds the potential to improve understanding and modelling accuracy. Tailoring solutions to address the unique challenges of each basin is imperative, with localised agencies tasked with addressing specific problem areas and aligning disparate sectors accordingly.

Ecological restoration can be achieved through targeted watershed management interventions, effectively revitalising the ecology of each respective area. In summary, the way forward involves adopting a holistic approach to water systems, empowering basin-based agencies, improving data collection, tailoring solutions to basin-specific challenges, and implementing targeted watershed management interventions for ecological restoration.

Way forward from the Water and Livelihoods session by Shri. S.C Sadhu, IAS, Secretary, Govt of Meghalaya

Looking ahead from the session on Water and Livelihoods chaired by Shri. S.C. Sadhu, the following key points were highlighted:

1. The primary focus is on the fishery sector, proposing the establishment of community-based fish sanctuaries in Meghalaya, utilising existing river networks. This initiative aims to create additional employment and livelihood opportunities centered around water resources.
2. Promoting integrated farming by merging the fishery sector with other agricultural and allied sectors is highlighted. This integration aims to enhance sustainability and resilience in the agricultural sector.
3. There's an emphasis on developing water-resilient harvesting systems through participatory approaches involving local communities. This initiative aims to enhance local capacity and resilience to water-related challenges.
4. The initiative seeks to augment knowledge dissemination and establish a value chain around the fishery sector within the state. This is crucial for ensuring sustainable development and economic growth in the region.

In summary, the way forward involves establishing community-based fish sanctuaries, promoting integrated farming, developing water-resilient harvesting systems through participatory approaches, and enhancing knowledge dissemination and value chain establishment in the fishery sector to ensure sustainable development and economic growth in Meghalaya.

Reflection on how the deliberations can help the State of Meghalaya and other participants by Shri. Joram Beda, IAS, Commissioner & Secretary, Govt. of Meghalaya

In discussions concerning climate change, several pivotal points were brought to the forefront and Shri. Joram Beda said that firstly, there is a unanimous acknowledgement that climate change represents a tangible and urgent issue, with dire consequences set to become irreversible within a limited timeframe without immediate action. Secondly, there is a collective recognition that we stand at a critical juncture where both climate change and development are imminent realities. While development cannot be halted in the face of climate change, global governments have coalesced around sustainable goals to confront these challenges.

Central to any climate change policy or action in hilly regions is the recognition that their ecosystems are inherently fragile and vulnerable. Therefore, Shri. Joram Beda said that the focus should be on climate-resilient interventions, which can be achieved through four distinct approaches: the community approach, watershed-centric approach, integrated approach, and utilisation of appropriate technology. He also said that the community approach underscores the paramount importance of water, acknowledging it as a precious commodity subject to the dynamics of demand and supply. The watershed-centric approach is deemed indispensable for conservation endeavours, as interventions must be source-centric. He further acknowledged the fact that an integrated approach is essential to surmount departmental silos, ensuring concerted efforts towards achieving desired outcomes. Additionally, the utilisation of appropriate technology is deemed crucial.

Finally, policy and regulatory mechanisms are identified as pivotal in addressing climate change in hilly regions, facilitating the implementation of effective strategies and interventions.

Shri. Joram Beda said that these themes can guide the development of comprehensive strategies to address water-related challenges in Meghalaya and other regions, focusing on community involvement, data-driven decision-making, inclusivity, resilience, capacity building, and effective policy frameworks.

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CLOSING PLENARY

The session presented insights from national-level experts, who provided valuable perspectives on the intersection of water and health systems across diverse themes. Attendees gained valuable reflections on the critical linkages between water management and public health from these esteemed speakers. Notably, this session differed in that all experts delivered their talks online to the attendees of the conclave, as they were not physically present at the venue.

Special Address:

Shri. D.P Wahlang, IAS, Chief Secretary, Meghalaya

During his special address, Shri. DP Wahlang highlighted the urgent issue of river health in the heart of Shillong, specifically focusing on the conditions of the Wahumkhrah and Umshyrpi rivers. He emphasised the Government's commitment to prioritising solutions to address these concerns. Despite Meghalaya's distinction for having the cleanest villages in Asia, Shillong, the capital city, contends with two of the most polluted rivers. Shri. Wahlang underscored the complexity of water management in the state, involving multiple departments, while acknowledging persistent challenges. He stressed the importance of interdepartmental collaboration and understanding the grassroots causes of water management issues, advocating for a holistic approach and urging departments to delve deeper into comprehending challenges at the ground level.

Regarding water connectivity initiatives such as the Jal Jeevan Mission (JJM), Shri. Wahlang noted that despite household connections, depleting water sources pose a looming threat. He emphasised the necessity of addressing issues at the grassroots level to ensure a sustainable water supply. Furthermore, Shri. Wahlang stressed the importance of follow-up actions, citing instances of tree plantation near water sources without subsequent monitoring. He urged departments to ensure post-plantation follow-up to maximise the effectiveness of such initiatives.

Shri. Wahlang also emphasised the rejuvenation of water sources and advocated for forestry activities to complement conservation efforts. He highlighted the significance of community involvement, suggesting closer engagement between departments and local communities. Additionally, Mr. Wahlang proposed integrating water conservation, waste management, and greywater treatment into school curricula, emphasising the importance of educating students about environmental responsibility. Lastly, Shri. Wahlang advocated for leveraging technology to enhance water management efficiency, emphasising the importance of embracing innovative solutions to address these challenges.

Presentation of the The Shillong Declaration

Building on the understanding of the inextricable interlinkages between water resources and hill ecosystems, and with a strong commitment to achieve sustainable development, all participants of The International Conclave on Water, Hill Lives and Future, held at Shillong in February 2024, jointly declare that the following important considerations around water, climate and sustainability of vital ecosystems will be attended holistically, while planning, financing, imparting, guiding, monitoring, and evaluating any developmental agenda, especially with reference to the hill region.

1. The vital role of water as a critical resource and the need for enhanced resilience around water in hilly terrains, as underscored by the declining water table and spring water levels, waning traditional water systems, retreating, and polluting rivers, changing rainfall patterns, increase in the natural disasters and the recent pandemic, among others.
2. The fact that hill regions will be vulnerable, in absence of improved, safe, and sustainable water management and any uncontrolled anthropogenic action can add to this risk. 48
3. The importance of protecting springs, rivers, and all other traditional water management systems as well as the complex nature of the hill ecosystems, and of ensuring sustainable and safe preservation of the aquifers and other water resources.
4. The necessity for adopting state-of-the-art technology for sanitation, waste, and wastewater treatment as well as for water recycling, to augment water availability.
5. The critical need to align agriculture, horticulture, forestry, poultry, animal husbandry, and all related livelihood initiatives in an appropriate manner, addressing water productivity of the hill ecosystems.
6. The unavoidable act of ensuring safety and quality of water for all kinds of human and cattle consumptions, by minimising contaminations and instituting context-appropriate measures for purifications and verifications.
7. The importance of not hampering the synergy with nature, and reassuring the commitment to the water and ecosystems, while bringing advanced amenities to enhance the quality of lives in hill systems.
8. The vitality of reconciling with any challenges to water systems, to sustainability and related measures and any adverse impact on the environment, while planning new infrastructure, industry, commerce, and business, in and for the region.
9. The significance of realising the critical challenges posed to nature and ecosystems, while commoditizing water and profiteering on it.
10. The need for participatory planning, implementation, and oversight of safe, sustainable, and resilient water management and governance systems to meet the drinking, domestic, irrigation, commercial, industrial, infrastructural, development, and emergency water needs of the population in all hill regions, in a reasonable manner.
11. The essentiality of safeguarding gender, equity, and inclusiveness in the entire process around water and climate.
12. Realising the human right to safe drinking water and sanitation with an acknowledgment that water, sanitation, and hygiene are fundamental for sustainable development.

All participants of the Conclave hereby commit to the careful realisation of the better future for the hill lives around water and climate, by way of generating necessary data, mindful reviews, and analysis of the same, and actions that lead to sustainability. We also expect that the fellow citizens who are residing in other terrains, community and civil society groups, governments at different levels, and global authorities, will reciprocate the spirit of this declaration and act upon the importance of building the future and safety of lives and the world around water.

Challenges and Solutions:

Throughout the two-day event of the International Water Conclave 2024 held in Shillong, common challenges and issues regarding water security were identified, alongside proposed solutions for addressing them:-

1. Water Scarcity: Numerous regions are confronted with water scarcity stemming from escalating demand, over-extraction, and the adverse impacts of climate change.
2. Water Pollution: The contamination of water sources due to industrial, agricultural, and urban activities poses a significant challenge to water quality and ecosystem health.
3. Climate Change Impacts: Alterations in precipitation patterns induced by climate change exacerbate water scarcity and intensify the frequency and severity of extreme weather events, further straining water resources.
4. Access to Clean Water and Sanitation: A substantial portion of the global population lacks access to clean water and adequate sanitation facilities, contributing to health risks and socioeconomic disparities.
5. Water Governance and Management: Ineffective water governance structures and deficient management practices perpetuate water-related challenges, hindering sustainable resource utilisation and equitable distribution.

Solutions:

1. Water Conservation and Efficiency Measures: Implementation of innovative technologies and best practices aimed at reducing water wastage and enhancing efficiency in water utilisation across sectors.
2. Sustainable Water Management: Adoption of holistic and integrated approaches to water resource management that prioritise ecological integrity, social equity, and economic viability, ensuring the long-term sustainability of water systems.
3. Water Treatment and Pollution Control: Investment in state-of-the-art water treatment technologies and the enforcement of stringent regulatory frameworks to mitigate water pollution and safeguard water quality.
4. Climate Change Adaptation Strategies: Development and implementation of adaptive measures to address the adverse impacts of climate change on water resources, including the adoption of water harvesting and storage techniques to enhance resilience.
5. Capacity Building and Stakeholder Engagement: Enhancement of institutional capacity through knowledge sharing, skill development, and the active engagement of stakeholders in decision-making processes, fostering inclusive and participatory water governance and management practices.

These measures collectively aim to address the multifaceted challenges associated with water management and ensure the sustainable utilisation and equitable distribution of this vital resource.

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Closing Plenary Session

Shillong Declaration

Adopted by the International Conclave on Water, Hill Lives and Future: 9-10 Feb 2024

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3. The importance of protecting springs, rivers, and all other traditional water management systems as well as the complex nature of the hill ecosystems, and of ensuring sustainable and safe preservation of the aquifers and other water resources.
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8. The vitality of reconciling with any challenges to water systems, its sustainability and related measures and any adverse impact on the environment, while planning new infrastructure, industry, commerce, and business, in and for the region.
9. The significance of realising the critical challenges posed to the nature and ecosystems, while commoditising water and profiteering on it.
10. The need of participatory planning, implementation, and oversight of safe, sustainable, and resilient water management and governance systems to meet the drinking, domestic, irrigation, commercial, industrial, infrastructural, developmental, and emergency water needs of populations in all hill regions, in a reasonable manner.
11. The essentiality of safeguarding gender, equity and inclusiveness in the entire processes around water and climate.
12. Realising the human right to safe drinking water and sanitation with an acknowledgement that water, sanitation and hygiene are fundamental for sustainable development.

All participants of the Conclave hereby commit to the careful realisation of the better future for the hill lives around water and climate, by way of generating necessary data, mindful reviews, and analysis of the same, and actions that lead to sustainability. We also expect that the fellow citizens who are residing in other terrains, community and civil society groups, governments at different levels, and global authorities, will reciprocate the spirit of this declaration and act upon the importance of building the future and safety of lives and the world around water.

Key Takeaways from the Conclave

Shri. Sangay Tenzin, Assistant Engineer at the Hydrology and Water Resources Services Division in Bhutan, extends his gratitude to the Government of Meghalaya for hosting an enlightening International Water Conclave. The main insight gleaned from the event is the recognition of water as a finite resource, particularly with shifting demographics and the looming impact of climate change. In nations like Bhutan, the significance of snow melt in the water resource landscape cannot be overstated. Addressing climate change requires proactive interventions, mitigation measures, and adaptive strategies. Moving away from compartmentalised thinking, there is a pressing need for an integrated, collaborative, and holistic approach to water management.

Ms. Saw Sanda Win, Deputy Director at the Ministry of Transport and Communication in Myanmar, highlighted the key insights from the "Rivers and Water System" session, focusing on the imperative of enhancing water systems through initiatives such as upgrading navigation channels and addressing riverbed erosion for enhanced sustainability.

Shri. Thach Sovanna, Director at the Ministry of Water Resources and Meteorology in Cambodia, commended the exchange of best practices and experiences in water resource management among participants from various nations. He emphasised the significance of events like the International Water Conclave in providing a platform to collectively address urgent issues concerning water conservation and management.

Shri. Susheel Chandra Acharya, Joint Secretary of Energy, Water Resources, and Irrigation in Nepal, emphasised the relevance of the Shillong Declaration to Nepal's context. He highlighted key points such as the promotion of water security, democratisation of water resources, water conservation efforts, and equitable sharing and distribution of benefits.

Dr. Chaiwut Grudpan, a Fisheries Lecturer at Ubon Ratchathani University in Thailand, emphasised the necessity of achieving a balance between development and sustainability.

Shri. Lance Gore, Principal Water Resources Specialist at ADB, praised the high-quality discussions during the sessions and emphasised the value of learning from neighbouring countries.

Engineer Kitoshe Y Aye, Superintending Engineer at PHE, Nagaland, expressed gratitude to the Government of Meghalaya for the invitation to attend the conclave. His main takeaway from the "Source Sustainability" session was the importance of implementing effective water distribution systems to address the challenge of water resource sustainability.

Shri. Nripendra Kumar Sarmah, Chief Engineer (PHE) in Assam, commended the organisers for orchestrating the International Water Conclave. Among the key insights gained were the importance of an inter-state approach to address challenges across the entire water spectrum, emphasising meaningful water utilisation, adopting a sustainable harvesting approach, and implementing conservation practices without disrupting biodiversity. He stressed the delicate balance needed between implementation and social considerations, advocating for the tagline "Water for community and community for water" to foster a healthy ecosystem. Furthermore, he proposed the establishment of an Inter-State panel within the Water Council.

Shri. Deepak Singh, Additional Chief Engineer from Sikkim, expressed his appreciation for the fruitful outcomes of the International Water Conclave and extended gratitude to the State of Meghalaya for hosting such a valuable event.

Engineer L. Angu, Chief Engineer (Planning & Development) and Team Leader from Arunachal Pradesh, highlighted key insights garnered from the sessions. These include the necessity of building a comprehensive database or repository to ensure that policymakers base their decisions on sound data. He stressed the importance of strengthening water governance mechanisms to overcome departmental silos. Furthermore, he emphasised the need for a holistic approach to water issues, aligning processes with the laws of nature to ensure economic and environmental sustainability while remaining adaptable to changing circumstances.

The conclave highlighted several cross-cutting themes that warrant consideration:

1. **Community Engagement:** Emphasising the involvement of local communities in decision-making and implementation processes.
2. **Data-Informed Decision Making:** Advocating the use of data and technology to inform policies and strategies.
3. **Gender and Equity:** Prioritising inclusivity and adopting gender-sensitive approaches.
4. **Holistic Approaches:** Integrating various sectors and stakeholders to develop comprehensive solutions.
5. **Sustainability and Resilience:** Ensuring long-term water security and resilience to climate change.
6. **Capacity Building:** Strengthening institutions and building skills for effective water management.
7. **Policy and Regulatory Frameworks:** Establishing robust regulations and policies to support sustainable water management.

These themes underscore the importance of collaborative and inclusive strategies in addressing water-related challenges.

Conclusion

The International Water Conclave 2024 held in Shillong concluded as a resounding success, bringing together experts, policymakers, and stakeholders worldwide to address critical water-related challenges. Throughout the event, insightful discussions and deliberations emphasised the urgency of adopting holistic, collaborative approaches to water management.

Key themes that emerged from the conclave included the importance of community engagement, data-informed decision-making, gender and equity considerations, holistic approaches to water management, sustainability and resilience, capacity building, and the need for robust policy and regulatory frameworks.

The conclave provided a platform for sharing best practices, innovative solutions, and actionable recommendations to address water scarcity, pollution, climate change impacts, and other pressing issues. It highlighted the significance of prioritising water security and fostering cooperation among various sectors and stakeholders to achieve sustainable water management.

The insights and outcomes of the International Water Conclave 2024 will serve as a guiding framework for policymakers and practitioners to implement effective strategies and initiatives to ensure equitable access to clean and safe water for all, while safeguarding the environment and promoting socio-economic development.

With a shared commitment to addressing water challenges, the conclave has paved the way for enhanced collaboration, innovation, and concerted action towards achieving water security and sustainability on a global scale.

Acknowledgments

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Links:

Rapporteur:

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DAY 01 **DAY 02**

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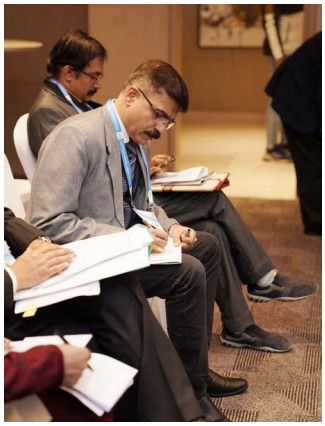
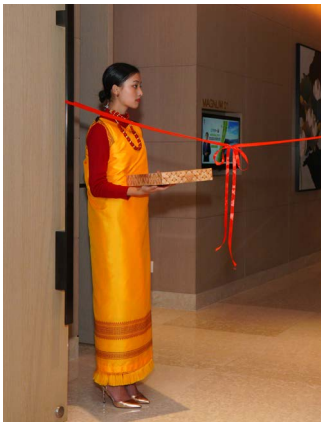
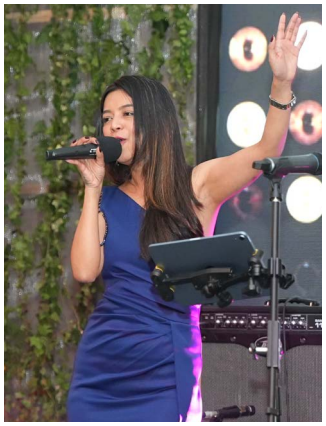
PHOTO GALLERY


MEGHALAYA
FIRST NORTH EASTERN STATE
TO INTRODUCE WATER POLICY




WATER, CLIMATE
AND DISASTERS






EXIT


Lower Mekong Basin-LMB


WAYFORWARD FOR ACTION
ON WATER IN HILL REGIONS
FROM DIFFERENT
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EXIT


International Water Conclave
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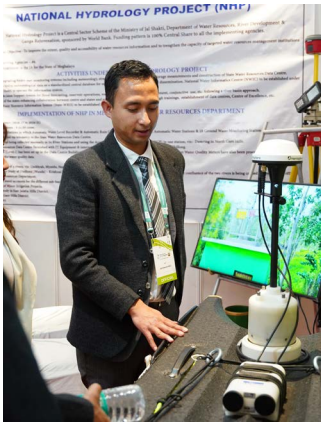
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Water Conclave
2024


CENTRAL GROUND WATER BOARD


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PLENARY


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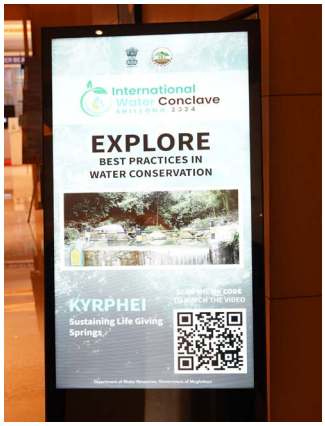
International
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EXPLORE
BEST PRACTICES IN
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KYRPHEI
Sustaining Life Giving
Springs


WATER RESOURCES DEPARTMENT


HYDROMET STATION AT UMIEW RIVER,
EAST KHASI HILLS DISTRICT


International Water Conclave


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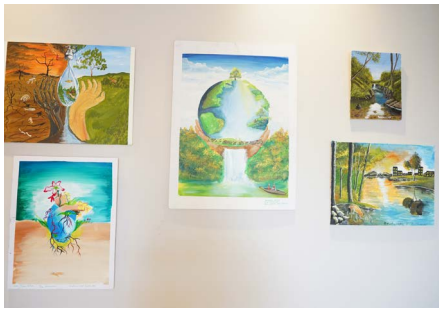
EXPLORE




CENTRAL WATER COMMISSION


EXPLORE
CATCHING RAINDROPS


JAL JEEVAN MISSION


WATER RESOURCES DEPARTMENT


CENTRAL WATER COMMISSION


CENTRAL GROUND WATER BOARD


PROJECT SITES UNDER DECENTRALIZED GREEN ENERGY DEVELOPMENT PROJECT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INTERNATIONAL WATER CONCLAVE EXHIBITION
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ELECTRONIC LOAD CONTROLLER


केन्द्रीय जल आयोग
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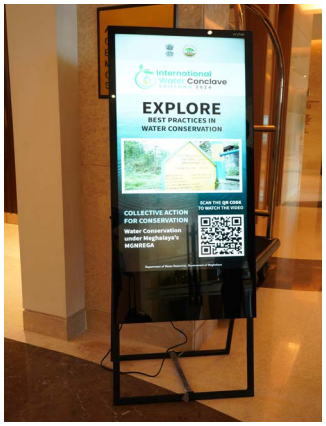
JURISDICTION MAP OF BRAHMAPUTRA BOARD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COLLECTIVE ACTION FOR CONSERVATION


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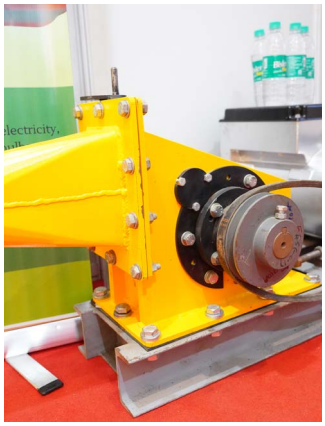
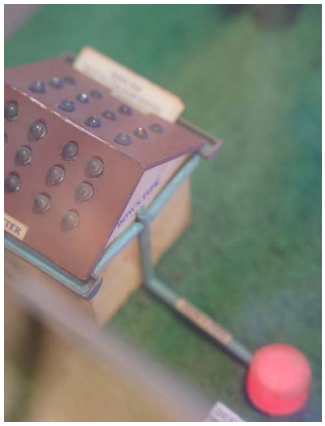
CO-OPERATION WITH DENMARK





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