MARITIME RESEARCH CENTER
FOUNDATION FOR UNDERWATER DOMAIN AWARENESS

NIR TECHNOLOGIES
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COP26 and the Brahmaputra – A New Perspective Based on the Underwater Domain Awareness (UDA) Framework – 02/06

WEBINAR

REPORT

05 February 2022 | 1600hrs

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MRC-NDT/UDA/02 Feb 2022

Covering Note

The Maritime Research Centre (MRC), Pune and M/S NirDhwani Technology Pvt Ltd, organised a webinar titled “COP26 and the Brahmaputra – A New Perspective Based on the Underwater Domain Awareness (UDA) Framework – 02/06”, on 05 Feb 2022, for the policy makers, scientific community, executives from the stakeholders and also students & faculty from the Academia. It is the first of the series of six webinars.

The webinar was a high level dialogue among the senior strategists and experts from the industry, security establishments, diplomatic community, policy makers and others to evolve a common strategy at the national and regional level. The panel members were unanimous in endorsing the relevance and the urgency of the UDA framework for effective governance in the Brahmaputra River Basin. The panel members included:

(a) Dr. Ashwin B Pandya, Former Chairman of CWC, India
(b) Dr. Srinivas Chokkakula, Ministry of Jal Shakti Chair.
(c) Shri N N Rai, Director (Hydrology) Central Water Commission.
(d) Dr. Harikrishna Paliwal, Former Chief Secretary of Arunachal Pradesh.
(e) Mrs. Radhika Seshan, Historian.
(f) Shri. Samudra Gupta Kashyap, State Information Commissioner Assam.
(g) Dr. Rajendra G Hiremath, Director at Rajpath Infracon.
(h) Prof Rajeshwari Raina, Shiv Nadar University (SNU), Greater Noida
(i) Dr(Cdr) Arnab Das, Founder & Director MRC, Pune

A report has been prepared to summarize the deliberations during the webinar and to give a broad way forward for actionable inputs for the various agencies and organizations both in the government and private sector. The detailed concept note has been attached. The substantive comments made by the esteemed panel members has also been summarized as part of this document. The video recording of the three hour high level dialogue is available at https://youtu.be/jSuyLJpCKdM

Dr (Cdr) Arnab Das
Founder & Director
Maritime Research Centre,
Pune

Report on Outcomes of the High Level Dialogue: COP26 and the Brahmaputra – A New Perspective Based on the Underwater Domain Awareness (UDA) Framework – 02/06

A webinar on the topic “COP26 and the Brahmaputra – A New Perspective Based on the Underwater Domain Awareness (UDA) Framework – 02/06” was held on the 05 Feb 2022 at 1600 hrs online, organized by the Maritime Research Centre (MRC), Pune and M/S NirDhwani Technology Pvt Ltd (NDT). The webinar was structured to discuss multiple dimensions of the issue with participants from several key areas like the policy makers, security agencies, blue industry, scientific community, diplomacy, and associated entities. The detailed concept note for the event and the list of panel members have been attached along with a brief on the substantive points made by the esteemed speakers.

The MRC, Pune was established as a technology based Think Tank to contribute to a national discourse and policy advocacy on Underwater Domain Awareness (UDA) in the Indian maritime zones, including internal waters, territorial waters, and the vast Exclusive Economic Zone (EEZ), the last extending over 23 lakh square kilometres. This contribution covers the entire spectrum of issues covering strategy, technology and innovation, and human resource development. The MRC seeks to complement the ongoing efforts to realise the vision of the Hon’ble Prime Minister of ensuring Security And Growth for All in the Region (SAGAR) in the Indian Ocean Region (IOR). The NDT is a start-up with niche R&D based capabilities in underwater acoustic hardware & software to enhance UDA capabilities. NDT is backed by researchers for high-end research based algorithms development & hardware configuration along with former naval colleagues to undertake field deployments.

The Indian Ocean Region (IOR) has attained significant strategic relevance in the 21st century. The strategic importance is related to maritime activities on all fronts and there is substantial interest among the nations within the region and outside to maintain their strategic maritime presence. The IOR, hosting important Sea Lanes of Communication (SLOCs) and massive undersea resources remains extremely critical for Blue Economic growth. However, the volatile regional geopolitical fluidity makes it a fertile ground for extra-regional powers to meddle with the domestic politics of the nations in the region. Consequently, the regional cooperation and the maritime governance have emerged as a major cause of concern. A detailed version of a holistic UDA framework as proposed by MRC, Pune is attached at enclosure-1. The socio-economic status of nations in the region requires a massive push towards economic growth even as the geopolitical and geo-strategic situation demands a nuanced approach. The safe, secure and sustainable growth model requires a comprehensive strategic vision with nations in the region coming together to pursue an effective roadmap on the way forward. The SAGAR vision is for

IOR security and development being primarily the task of the littoral states whilst extra-regional users of these waters adhere to the well-known principles of international law and conduct: any other approach is fraught with high prospects of military confrontation and regional instability. The maligned non-state actors are boldly having a free run, fuelling piracy and terrorism finding encouragement from certain internationally well-known quarters. Brahmaputra River Basin (BRB) governance has been a major cause of concern. Strategic cooperation with a binding framework is inescapable.

The ***UDA framework*** proposed by the MRC has significant merit in ensuring effective maritime governance in the IOR and beyond. The deliberations through the webinar recognized the relevance of the UDA framework and proposed setting up of a Centre of Excellence on the UDA Framework. The specific way forward collectively envisioned by the distinguished speakers and the participants are as follows:

(a) The importance of the river basin in ensuring sustainable growth across the stakeholders needs to be recognized and prioritized. Environmental Impact Assessment (EIA) has to be undertaken more comprehensively.

(b) Role of think tanks with deeper understanding of science & technology aspects in policy formulation was acknowledged. Closer interaction between the government and entities like MRC was encouraged. Sensitising our law makers both at the centre and the states needs to be taken up on priority.

(c) Setting up of a ***Centre of Excellence*** (COE) for progressing the UDA framework for effective maritime governance was unanimously endorsed. More details on the COE is attached at enclosure-2.

(d) The panellists also approved a three tier strategy of ***outreach, engage and sustain.*** The details are mentioned below:

Outreach The stakeholders across the stakeholders within and the nations in the region need to be made aware of the specific takeaways of the UDA framework through workshops & seminars, academic & corporate exchanges, short courses and bilateral & multilateral interactions. This kind of activities will facilitate heightened diplomatic outreach for India in the region.

Engage Post the outreach, we need to engage with these stakeholders and the nations for more involved capacity and capability building across multiple stakeholders. This will include UDA fellowships, academic degree programs in our institutes for their students & young professionals and joint projects under bilateral & multilateral MoUs. This will give us deeper penetration into their governance mechanisms.

Sustain The deeper penetration needs to be sustained with regional regulatory framework, establishment of a Centre of Excellence and inclusion of the UDA framework as an agenda point in the regional and global forums like IORA, BIMSTEC, IONS, Indian Ocean Commission, G-20, G-07 and more.

The three tier strategy will require massive capacity and capability building at the national level first. This can be achieved with a dedicated national capacity & capability building program, backed by the NITI Aayog. A User-Academia-Industry partnership with participation of all the stakeholders is required on priority.

There is significant merit in taking forward the above way ahead and the Maritime Research Centre (MRC), in partnership with M/S NirDhwani Technology Pvt Ltd (NDT) is well equipped to play a leading role in progressing the UDA framework for effective maritime governance in the IOR and beyond for true realization of the SAGAR vision. MRC will be keen to engage with the key authorities and institutions to take forward the policy advocacy, development of technology & innovation and comprehensive capacity & capability building. The MRC website (https://mrc.foundationforuda.in/) has more details on the projects being undertaken by them along with the engagements undertaken in the last four years since its inception.

Enclosure-1

Underwater Domain Awareness (UDA) Framework

The concept of Underwater Domain Awareness (UDA) in a more specific sense will translate to our eagerness to know what is happening in the undersea realm of our maritime areas. This keenness for undersea awareness from the security perspective, means defending our Sea Lines of Communication (SLOC), coastal waters and varied maritime assets against the proliferation of submarines and mine capabilities intended to limit the access to the seas and littoral waters. However, just the military requirement may not be the only motivation to generate undersea domain awareness. The earth's undersea geophysical activities have a lot of relevance to the wellbeing of the human kind and monitoring of such activities could provide vital clues to minimize the impact of devastating natural calamities. The commercial activities in the undersea realm need precise inputs on the availability of resources to be able to effectively and efficiently explore and exploit them for economic gains. The regulators on the other hand need to know the pattern of exploitation to manage a sustainable plan. With so much of activities, commercial and military, there is significant impact on the environment. Any conservation initiative needs to precisely estimate the habitat degradation and species vulnerability caused by these activities and assess the ecosystem status. The scientific and the research community need to engage and continuously update our knowledge and access of the multiple aspects of the undersea domain. Fig. 1, presents a comprehensive perspective of the UDA. The underlying requirement for all the stakeholders is to know the developments in the undersea domain, make sense out of these developments and then respond effectively and efficiently to them before they take shape of an event.

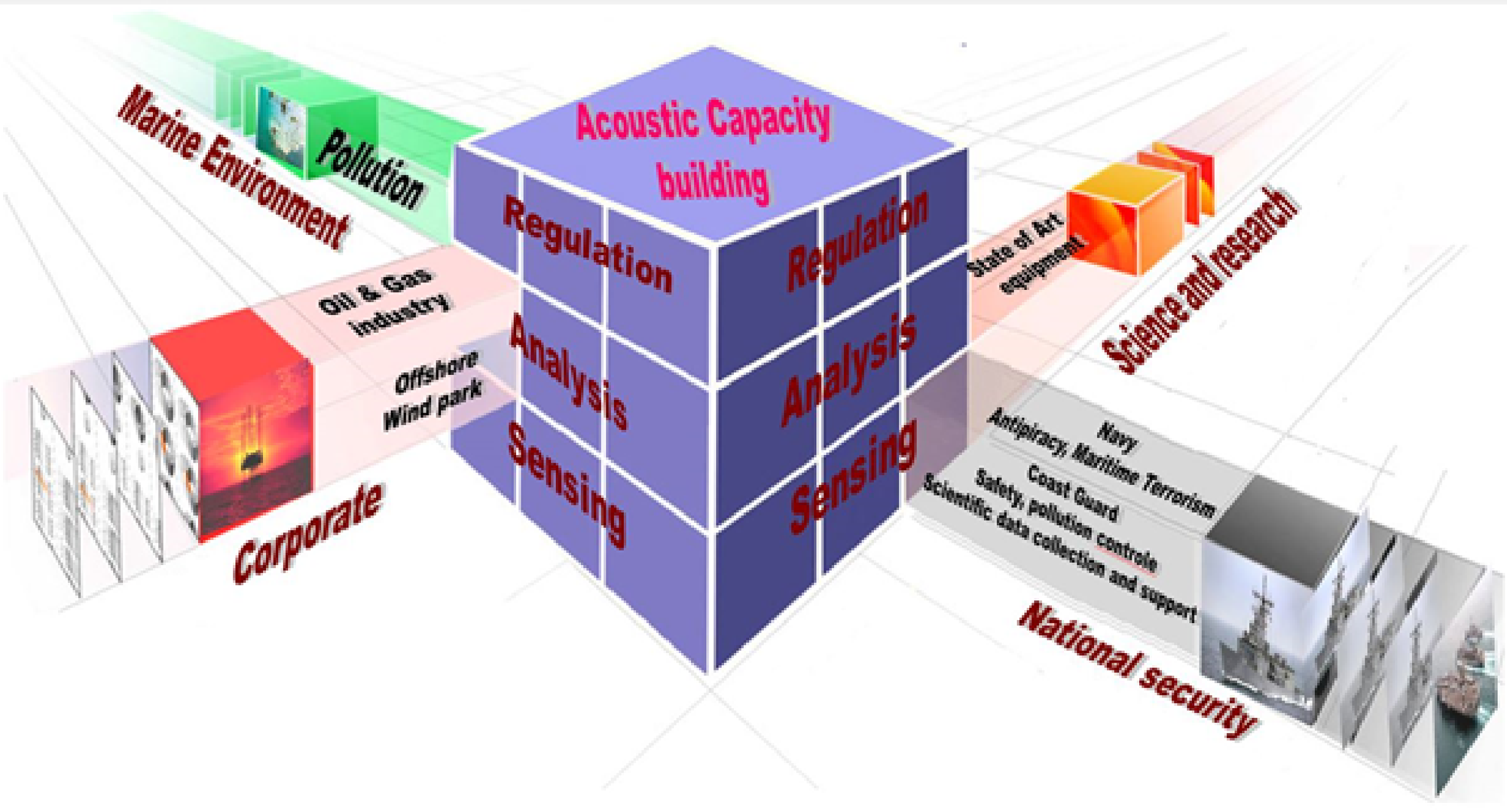

Fig. 1 Comprehensive Perspective of Undersea Domain Awareness

The UDA on a comprehensive scale needs to be understood in its horizontal and vertical construct. The horizontal construct would be the resource availability in terms of technology, infrastructure, capability and capacity specific to the stakeholders or otherwise. The stakeholders represented by the four faces of the cube will have their specific requirements, however the core will remain the acoustic capacity and capability. The vertical construct is the hierarchy of establishing a comprehensive UDA. The first level or the ground level would be the sensing of the undersea domain for threats, resources and activities. The second level would be making sense of the data generated to plan security strategies, conservation plans and resource utilization plans. The next level would be to formulate and monitor regulatory framework at the local, national and global level.

The figure above gives a comprehensive way forward for the stakeholders to engage and interact. The individual cubes represent specific aspects that need to be addressed. The User-Academia-Industry partnership can be seamlessly formulated based on the user requirement, academic inputs and the industry interface represented by the specific cube. It will enable more focused approach and well defined interactive framework. Given the appropriate impetus, the UDA framework can address multiple challenges being faced by the nation today. Meaningful engagement of Young India for Nation Building, probably is the most critical aspect that deserves attention. Multi-disciplinary and multi-functional entities can interact and contribute to seamlessly synergize their efforts towards a larger goal.

The UDA Framework as proposed above has been formulated jointly by the Maritime Research Centre (MRC), Pune and M/S NirDhwani Technology Pvt Ltd (NDT). The focus is on all the three aspects namely Policy, Technology & Innovation and Human Resource Development. More details are available in the MRC website https://mrc.foundationforuda.in/

Enclosure-2

Centre of Excellence on Underwater Domain Awareness (UDA) Framework

This proposal includes the establishment of a ***"Centre of Excellence"*** comprising 5 sub-centres (or verticals), under the MRC, which would be characterised by a strong coherence but with independent activities. This Centre will advance the capacity and capability building objectives outlined at para (I) above. All the five centres will draw inputs from each other but have their unique and well defines Key Result Areas (KRAs) and Key Performance Areas (KPAs). The five sub-centres under the Centre of Excellence are listed below:

(a) The first will be ***strategy centre*** that will keep track of the R&D and industry requirements to build effective policy frameworks. There will be data driven policy formulation to address the stakeholder requirements. The KRA for the strategy centre will be to identify gaps in the domestic and regional policies and formulate effective way forward to build regional cooperation and effective maritime governance. The KPAs will reflect in seamless diplomatic interactions in the IOR and the wider Indo-Pacific region. India's leadership in the regional forums like IORA, BIMSTEC, G-20, G-07 and the Indo-Pacific Oceans Initiative will be key indicator of our success.

(b) The second will be a multi-disciplinary ***research centre*** that will provide cutting edge inputs with site specific field experimental R&D to address the core acoustic capacity and capability building requirements. The IOR with its unique tropical littoral waters needs sustained indigenous R&D efforts to overcome the challenges and capitalize on the opportunities. These efforts should be able to provide nuanced inputs for the strategy centre for effective policy formulation with data driven real time ground understanding. This should minimise the dependence on the technology imports and also enhance our strategic capabilities. Home grown science & technology dominance will minimize strategic risks for security and other critical projects. The activities of this sub-centre would be of relevance to our maritime outlook in its widest scope.

(c) The third will be an ***incubation centre*** that will map the research outcomes of the research centre to application specific requirements of the stakeholders. Start-ups and industries can draw ideas from here and build business plans. India's self-reliance on critical strategic issues will be critically depend on this initiative. The start-ups are always known for their agility to build high-tech solutions and the UDA framework has unimaginable possibilities. The effective eco-system provided by this incubation centre will nurture the talent pool we have in the country and provide innovative directions to channelize their efforts towards nation building.

(d) The fourth will be a ***training centre*** that will ensure the professionals and practitioners from the stakeholders, including partner countries to understand the nuances of the UDA framework and apply them effectively in their operations and strategic planning. This will not only make our practitioners more scientific and effective in their routine operations but also promote building the national infrastructure and bring seamless collaboration across the stakeholders. This facility will add to our diplomatic leverage in the pursuit of our larger maritime objectives.

(e) The fifth will be the ***academic centre*** that will build academic programs along with project based learning to prepare the next generation of students and professions to attain higher professional qualifications to appropriately take forward the UDA framework. The professional enhancement will be a very critical aspect to bring regional cooperation. The young generation and the experienced professionals sitting together and working on regional issues need no elaboration for its impact on regional cooperation. These centres will be the hotbed of innovations and ideas for effective progress and seamless interactions at all levels of decision making.

Substantive Comments by the Esteemed Speakers

Dr. Ashwin B Pandya
Secretary-General at ICID and Former Chairman of CWC, India

Dr Pandya thanked Dr Das and all the eminent personalities present in the webinar with great pleasure. He further discussed this vital issue with importance from India's water security point.

Further highlighting, the most important developmental issue is not only for COP 26 but also for a developing country like us with equitable and balanced manner. It is not for us to decide about what the individual basin or individual area will do as far as their management is concerned but also how the entire integration takes place at all our resources totality, how we can progress on certain areas relevant for India's water security. This shall further examine the role of the Brahmaputra basin.

Moving ahead, with an informative presentation about the overall water availability in India with its geographical area along its major river basins. He further highlighted our significant developing area for the two major river basins - Ganga and the Brahmaputra, which confluence at Bangladesh and hydrologically fall into a single river system These basins have a characteristic of being international along with transboundary issues.

Emphasizing with a graphical presentation on the water wealth of India in terms of Surface water and groundwater he further stated, "groundwater has been very attractive overdevelopment or overexploitation of groundwater has occurred because of its ubiquitous on the other hand, sustainable development of surface water resources which are capable of regenerating themselves ". Further, he also spoke about the Brahmaputra water distribution being the largest in the country.

He also presented the topological acceptance of the Brahmaputra- rainfall pattern, flood pattern, and its basin flow. He overviewed the navigation depths associated with Ganga Brahmaputra integrated waterway with a reference article written in the Hindustan times written by our honourable minister for shipping and transport Mr Sivananda Sunawal.

On Conclusion, he said the Brahmaputra basin viability and the basin importance is extremely useful and necessary for us and we need to work strongly on its sustainability.

<u>Dr Harikrishna Paliwal</u>
Former Chief Secretary of Arunachal Pradesh.

Dr Paliwal was grateful to have this opportunity he stated the Brahmaputra is highlighted as the country's most important basin. He spoke about the geographical existence of the river. Emphasizing the flood moderation environmental issues along with the development of the area. Further, he stated the concern about water restoration in the country which can be overcome with proper planning of major floodwater from the Brahmaputra river.

He suggested planning for dams at the basins for water restoration, along with the floodwater statistics. The development of well-planned hydropower projects can help in the economic growth of the country. He gave an insight into the energy generation metrics.

He also spoke about the various environmental issues that had been raised on hydropower projects, further decreasing carbon emissions while restoring melting glaciers indeed helping the river water system. The government of India has been emphasizing solar power and wind power and now of late, there has been a concern for the development of hydropower. He shared some statics on how the country shall be saving foreign exchange.

<u>Dr Srinivas Chokkakula</u>
<u>Ministry of Jal Shakti Chair</u>

Dr Srinivas spoke about the previous presentations precisely focusing on governing the ecosystems and then giving a context about the idea of water conflicts and governance in the Brahmaputra basin.

He said, "The Brahmaputra is one of those unique contexts where you have both national as well as international transboundary challenges in terms of governance challenges as it's an interstate as well as an international river."

He said that the basin is not given adequate attention in terms of developmental agenda secondly, the background backdrop of cop 26 which received the focus is on climate change needs to be recognized between hydrological regimes. He further elaborated with the UN water report on climate change along with a research gap.

Further, he shared how transboundary water sharing is understood- water sharing may have an existence of a conflict, as well as cooperation, moving ahead this is going to have limited impact on legal responses. The legal responses shall be supplemented both political as well as institutional he added.

<u>Shri N N Rai</u>
Director (Hydrology)
Central Water Commission.

Shri N N Rai spoke about the issues related to north-eastern water resources with a focus on the Brahmaputra river basin followed by a graphical presentation about water availability its water security.

He also discussed the Brahmaputra basin potential – inter river basin, hydropower potential, irrigation potential with some siltation and erosion shortcomings which are some developmental issues. Moving forward he presented the environmental concerns that need to be handled precisely with desired goals.

He concluded the well-planned water resource projects are essential for the development of the NE region and economy, river schemes, flood control measures hydropower generation with major employment generation industrialization.

<u>Prof Rajeshwari Raina</u>
Shiv Nadar University (SNU),
Greater Noida.

Prof Rajeshwari complementing the webinar commenced with some key insights about the Brahmaputra with some major points:
Dr Pandya‘s observation about the way we see the river interventions in water waste investment and its distribution followed by its ecosystem. Further in sighting Dr Rai’s hydromechanics.

She said, “that how rivers carry the water into the ocean relatively thin though, the top layer of fewer saline waters what decides the monsoon we have- a major driver of the rainfall.” Upon concluding she stated, about the diverse networks of the massive river system which impact society as well as economically for the Northeast corridor of development.

Remarks by Special Invitees

Dr Rajendra G Hiremath
Director at Rajpath Infracon.

Dr Hiremath appreciated this webinar's approach and gave compliments about the speaker's dialogues, he continued with developmental issues for the Brahmaputra river basin. Mentioning further about the policy reforms like- Sagar Mala, Bharat mala, The Bharat Mala inland water transport by the central government working under the leadership of honourable Prime Minister Narendra Modi, which has not only helped our country to strengthen our geopolitical position but also capitalizing the available resources with maximum extent.

On concluding, the pride of our nation's growing economy despite the pandemic situation with more insights into the infrastructural fund investment.
Emphasizing the responsibility of Maritime research center MRC along with the scholars and government for capitalizing on the policies for the development of the river basin, he added.

Mrs Radhika Seshan
Historian

Mrs Radhika spoke about the Brahmaputra in the broader context of history and of the region in which the Brahmaputra is situated. She emphasized the key importance in understanding how we relate to the region and the river with three different ecosystems along with diverse cultural contexts too and the knowledge systems relating to the environment. Along with the Brahmaputra, she also mentioned about Tisha river its tremendous significance the constant memory of living with danger with seasonal variations, affecting the agricultural areas of the river basin.

Later she said," the water is something to be remembered in terms of livelihood and knowledge, the freshwater aquatic life and the link to the entire economy of the export land to the entire story economy of the region".

Sharing some glimpses of the historical form of the geographical existence of the river.
She concluded by saying, how the Brahmaputra is to be approached people's places cultures and river in civilizations."

<u>Shri. Samudra Gupta Kashyap</u>
State Information Commissioner
Assam.

Shri. Samudra spoke with a different aspect on the Brahmaputra alighting its system, concept democrat as a culture, civilization, and its endless story. He then acknowledged the project – 'Brahmaputra an endless journey' further he enlightened with the known biodiversity and its mythological stories of the river.

In closing, the hydroelectric power generation which is the least utilization can be enhanced by considering groundwater problems along with a good irrigation and water storage system. Tourism has a huge potential that is yet to be explored, he added

Remarks by Hosts

Dr. (Cdr) Arnab Das
Founder & Director, MRC , Pune

Dr Das acknowledged an excellent start of the Webinar by valuing extensive statistical data along with the strategical perspective involved. He further mentioned the perspective of the Underwater Domain Awareness (UDA) framework which is developed at the Maritime Research Center.
The said framework shall give a safe secure sustainable growth in the entire Indo-Pacific region bringing our focus into the tropical growth. A quick mention about the geopolitical and the geostrategic perspective overviewing the larger tropical interactions.
He also flagged out a point about sharing the Brahmaputra basin and its association with the four countries China, Bhutan, Bangladesh, and India. Along with this, he also stated about the China Water stress. While planning he requested the experts to focus on the Brahmaputra Basin people, economy, and nature.

A further mentioned about the government policy and how we can contribute in prevention to future acoustic habitat degradation, “Development is important but how do we navigate development with better awareness” so Underwater Domain Awareness (UDA) framework.
“Water quality Management and its issues also need to be enhanced, “ he added.
Keeping track of security in geopolitical situations, how to build systems, where our infrastructure investments and developmental programs are securely handled, was another issue raised by Dr Das. He also spoke about Blue Economy with its various projects and sustainability concerns.

Lastly, he spoke about the Underwater Domain Awareness (UDA) framework which was a lot of research and studies are required thus, inviting all the stakeholders to work in hand which shall pull in the resources and synergizes efforts. This framework can also invite the youth of India to some significant employment opportunities.
A lot of information about Acoustic mapping, sensitizing people with various programs to make people aware along with fieldwork looking forward to keen contribution by the stakeholders.
Dr Das concluded the purpose of such webinar to – “Outreach and Engage with sustainable projects where we can bring the policy technology interventions and the capacity building.”

Ms. Ananya Malik
MRC RA (Brahmaputra)

Expressing her gratitude for this opportunity she thanked all the dignitaries on behalf of the maritime research center, extending a warm welcome to the people in the webinar and complementing the speakers for their thought-provoking, enlightening, and insightful discussion along with their shared views and expertise on this domain. She pointed out that this framework is fairly new and it’s very motivating seeing so many experts coming together to discuss and work on it. Concluding she wished everyone good health amidst this pandemic.

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Enclosure-3

Concept Note

The river Brahmaputra has played a critical role in shaping the culture, heritage and economy of Assam. There is potential for more and it is essential that we build capabilities and capacities for a safe, secure and sustainable growth of the region with optimum utilization of the resources in the river.

- The ‘safe’ addresses the disaster management efforts originating from the river – it could mean prevention and post event rehabilitation.
- The ‘secure’ address the security concerns that may originate from the river or even endanger assets in the river. The volatile security situation in the region does demand fresh initiatives that are able to address the concerns.
- The ‘sustainable growth’ pertains to economic growth with minimal degradation to the river flora and fauna.

The river ecosystem particularly in the tropical regions represents significant biodiversity with rich source of food and other resources. The sustainable growth model will require substantial efforts in ensuring minimal degradation of the river ecosystem. The river species including the river dolphins use sound or acoustic signals for multiple biologically critical functions like communication, navigation, foraging, breeding, etc. Thus, the acoustic habitat plays a critical role in their wellbeing and population abundance. There are innumerable dimensions of human interaction with these freshwater bodies. The growing human interventions can limit our usage of this critical resource and make us extremely vulnerable. The usage apart from domestic consumption can range from navigable waters for river transport, hydropower generation, exploitation of the living & non-living resources, climate control, wellbeing of the local flora & fauna, disaster management and more. The river provides a vital source of livelihood and economic prosperity to the region and also poses a great challenge to human life, flora & fauna, due to floods and erosion disasters. At present, the consumptive use of the river waters is at a minimum stage. However, the annual yield of the basin forms almost 30% of the annual water resources of the country. Thereby the basin has a great importance in supporting the water & energy security of the country.

The COP26 dialogues have brought out the critical role of the renewable energy sources in mitigating the climate change by substitution of fossil fuels for energy generation. Brahmaputra basin is the single greatest source of renewable energy to the extent of 40,000 MW and the same forms a very vital part of INDC goals committed by the nation to the world. Impacts on these resources also needs to be carefully evaluated and provided for. Moreover, Bangladesh is also critically short of renewable energy sources and will have to be supported by India for their wellbeing. Brahmaputra developments are important in this regard also. The Underwater Domain Awareness (UDA) is extremely critical for effective governance at all levels. There are multiple mega initiatives from the Government of India (GoI) today to enhance our growth and prosperity, however the sustainability remains a concern. A high-technology infrastructure needs to be put in place that can monitor the entire situation in real-time and provide the decision makers actionable

inputs on a tactical and strategic level. Right from the policy & technology interventions as well as capacity & capability building to manage such a high-technology systems will require substantial understanding and strategic vision. Organizational structure and interaction among the government and private players need to be planned to facilitate effective governance mechanism. Pooling of resources and synergizing of efforts across stakeholders, with high deployment of Science & Technology (S&T) tools, is the key to success. The COP26 summit has once again drawn attention of the entire global community to sustainable growth models and the climate change concerns. The Brahmaputra with its unique characteristics is a good case study to build on such sustainable development models.

Proposal

The state of Assam is extremely blessed in terms of the mighty river Brahmaputra flowing from one end to the other with over 900 kms of river length across the state. The resource availability is unprecedented, however the challenges of water resource management also has its own dimensions and dynamics.

The MRC and M/S NirDhwani Technology Pvt Ltd (NDT), organized a webinar on ***05 Feb 2022 at 1600 hrs.*** The title of the seminar was ***"COP26 and the Brahmaputra: A New Perspective Based on the Underwater Domain Awareness (UDA) Framework"***. The seminar brought all the stakeholders together focusing on the UDA framework on multiple aspects of the water resource management issue. A detailed seminar was formalized and forwarded to the policymakers, stakeholders and practitioners for a nuanced way ahead.

Program

1600 hrs- Opening Address by Dr. Ashwin B Pandya,
Secretary General at ICID and Former Chairman of CWC, India.
1615 hrs- Introductory Remarks on the UDA Framework and the River Systems.
Dr(Cdr) Arnab Das, Founder & Director MRC, Pune.
1645 hrs- Water Conflicts & Governance.
Dr. Srinivas Chokkakula, Ministry of Jal Shakti Chair.
1700 hrs- River Brahmaputra and the Hydrology Challenges.
Shri N N Rai, Director (Hydrology) Central Water Commission.
1715 hrs- Arunachal Pradesh and the Socio-political Dimension.
Dr. Harikrishna Paliwal, Former Chief Secretary of Arunachal Pradesh.
1730 hrs- Special Interventions:
Mrs. Radhika Seshan, Historian.
Shri. Samudra Gupta Kashyap, State Information Commissioner Assam.
Dr. Rajendra G Hiremath, Director at Rajpath Infracon.
1810 hrs- Closing Remarks and Way Ahead.
Prof Rajeshwari Raina, Shiv Nadar University (SNU), Greater Noida.
1825 hrs- Vote of Thanks by Ms. Ananya Malik, MRC RA (Brahmaputra).

Convenor

Dr.(Cdr) Arnab Das, Founder & Director MRC, Pune.
Mobile-9665033463, Email-director.mrc@foundationforuda.in

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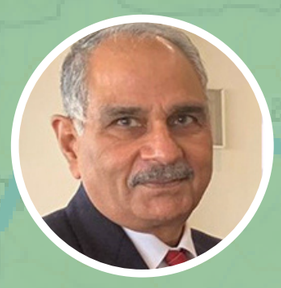
ESTEEMED GUESTS

DR. ASHWIN B PANDYA
Secretary General at ICID and Former Chairman of CWC, India

DR. PARTHA J DAS
Head Climate & Hazards Div, Aaranyak Guwahati.

DR. SRINIVAS CHOKKAKULA
Ministry of Jal Shakti Chair

SHRI N N RAI
Director (Hydrology) Central Water Commission.



DR. HARIKRISHNA PALIWAL
Former Chief Secretary of Arunachal Pradesh.

PROF RAJESHWARI RAINA
Shiv Nadar University (SNU), Greater Noida.

SPECIAL INVITEES

DR. RAJENDRA G HIREMATH
Director at Rajpath Infracon

MRS. RADHIKA SESHAN
Historian.

SHRI S V K REDDY
Chief Engineer Inland Water Transport Authority

SHRI. SAMUDRA GUPTA KASHYAP
State Information Commissioner Assam.

HOSTS

DR (CDR) ARNAB DAS
Founder & Director MRC, Pune

MS ANANYA MALIK
MRC Research Associate (Brahmaputra).

UN CLIMATE CHANGE CONFERENCE UK 2021

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