



*COP26 and the Brahmaputra –
A New Perspective Based on the
Underwater Domain Awareness (UDA)
Framework – 01/06*

WEBINAR

REPORT

05 January 2022 | 1600hrs



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MRC-NDT/UDA/01

Jan 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 – 01/06”, on 05 Jan 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) Himangshu Sekhar Das IAS, Chief Information Officer, Govt of Assam.
- (b) Dr. Arup Misra, Chairman Assam Pollution Control Board.
- (c) Shri Jayant Singh, Vice Chairman Inland Water Transport Authority of India.
- (d) Prof Anamika Barua, Dept of Humanities & Social Sciences, IIT Guwahati.
- (e) Dr. Himanshu Kulkarni, Executive Director & Secretary ACWADAM.
- (f) Shri Shripad Dharmadhikary, Coordinator Manthan Adhyayan Kendra.
- (g) Prof Ajay Dandekar, Shiv Nadar University (SNU), Greater Noida.
- (h) Shri Jagdish Kadam, CEO Rajpath Infracon.
- (i) Dr. Pranab J Pattar, CEO Global Foundation.
- (j) 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/QwKR5bO1RMw>

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 – 01/06

A webinar on the topic “COP26 and the Brahmaputra – A New Perspective Based on the Underwater Domain Awareness (UDA) Framework – 01/06” was held on the 05 Jan 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.

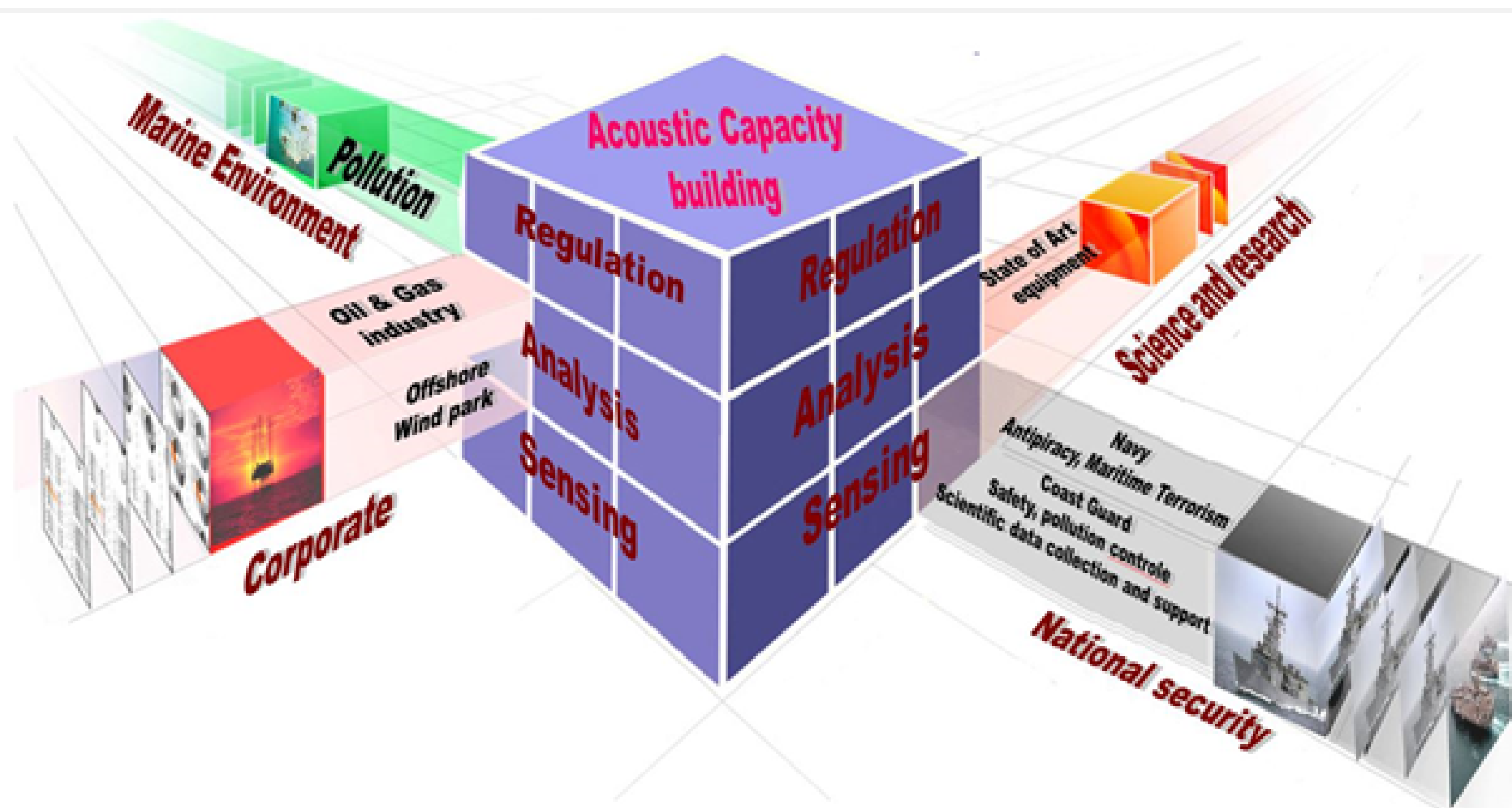


Fig. 1 Comprehensive Perspective of Undersea Domain Awareness

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/>

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



Himangshu Sekhar Das IAS
Chief Information Officer,
Government of Assam

Mr Himangshu commenced by expressing how honoured he felt to be part of this webinar, having served in Brahmaputra Basin for many years. Stating, historical background on the various myths of the River and how it has influenced the riparian communities' culture with songs and poems written around the Brahmaputra.

He further added the Brahmaputra is the lifeline of Assam. The early River Valley civilizations, which inspired a lot of play songs and poems in its name, are somehow missing in today's world. Our focus is shifting more on infrastructure competition between India and China and it is causing a huge amount of deforestation, which is worrisome.

Going further, a river like the Brahmaputra mainly obtains water from rains occurring through the heavy forest nearby. Due to continuous deforestation occurring at the basin, we are likely going to see higher impacts in nearby future.

Moving ahead he also stated many wars have been fought in the Brahmaputra basin highlighting the National Security associated with death dead.

“Further, this continual climate change shall not only impact the surface and groundwater levels but, also change the flooding pattern of the river”, he emphasized.

In conclusion, he stated that the Brahmaputra is a highly braided river with a unique transboundary basin. Therefore, awareness about it is necessary and webinars like these along with the work done by mercy are a good step in that direction.

The Brahmaputra is a highly braided river with a unique transboundary basin therefore awareness about it is necessary and webinars like this along with the work done by mercy is a good step in that direction.



Dr Arup Misra
Chairman Assam
Pollution Control
Board.

Dr Arup began by stating that he was very enthusiastic about this webinar. He further added that without the Brahmaputra River we could not even think of Assam. His presentation showed how the Brahmaputra is an interesting and unique river.

He explained how the Brahmaputra is a classic example of a heavy discharged river making it good for navigating opportunities however, this is not fully explored by India. Due to this high volume discharge, the river is much cleaner than other rivers of India like the Ganga. Elaborating further on pollution, the fact that there is a lack of industries and less population density eventually contributes to low pollution levels in the Brahmaputra. However, things are now changing with population rise, improper waste disposal especially plastic waste, rapid development, and urbanization are leading to deforestation to meet our high demands which is a critical emerging issue. While in terms of agriculture the increase in population and productivity are also increasing the level of agrochemicals in the drainage, which is now further adding to the pollution levels.

Further, the Pollution Control Boards' involvement can help to mitigate these emerging issues with their domain ranging from control of industrial pollution, environmental monitoring, waste management, to research activities and development.

He concluded by recommending a few ways to reduce pollution - managed consumption, managing waste, using few chemicals in agro-industry, upcycling and recycling, and most important conserving water and electricity.



Prof Anamika Barua
**Dept of Humanities & Social
Sciences, IIT Guwahati**

Prof Barua began by stating how helpful these types of webinars are, as it has provided her with an opportunity to share dialogues with people and government authorities about the Brahmaputra River and its various issues.

During her presentation on "climate change, the Brahmaputra river basin and northeast - the road ahead", during which she spoke about the climate risk framework and its association with rivers like the Brahmaputra explaining its various risks components like hazard, vulnerability, and exposure as other factors are interconnected. She further added that we need to worry about Assam and the North East of India as they often face natural calamities such as landslides, floods, and droughts; this exposes fragile ecosystems and weak infrastructure leading to poverty, and climate-sensitive livelihoods along with its social-economic, and biophysical vulnerabilities. Moving on she also highlighted the issues of the Brahmaputra including its major challenges of floods, erosion, and sedimentation; Interstate disputes; unequal water infrastructure development, and water diversion plans which cause risk of water insecurities.

She further elaborated on the challenges in the Brahmaputra basin such as limited research and understanding of climate change scenarios, lack of trust and communication between multiple stakeholders, and missing of three I's- information, institution, and investment.

Concluding on a positive note, she recommended various strategies that shall include in the Brahmaputra river basin along with these types of platforms to discuss the concerns and identify a common approach in near future. She explained the BRB strategy and its pillars including a common knowledge platform, disaster, climate resilience, and cooperation through benefit sharing. She concluded by inviting the attendees to her podcast- 'The voice of Brahmaputra' to know more about it.



Dr. Pranab J Pattar
CEO, Global Foundation.

Dr Pranab began by presenting "CSR and Community Engagement: Relevance and Opportunities " while introducing his organization The Global Foundation for Advancement of Environment and Human Wellness.

He spoke about the underlying factors like common environmental issues, climate change risk, and its impacts in the Brahmaputra basin. As the Brahmaputra is also experiencing growing vulnerabilities, which are becoming more and more evident due to the increase in climate risk, it is one of the major risks to Assam as its huge biological diversity depends on the river.

Speaking on a positive note, he explored how SDGs and corporate social responsibility can connect to develop frameworks and programs to assist community developments in the Brahmaputra basin. He explained how CSR integrated with UDA could help in generating livelihood and employment for the economically weaker section of the population. Along with providing sustainable development mechanisms in sectors like agriculture, water, health, sanitation, and education sector while also targeting climate actions to mitigate climate risk.

Concluding his remarks, he recommended that we need a centralized approach to develop and conserve resources while leveraging CSR opportunities with an integrated approach for maximum community development.



Shri Shripad
Dharmadhikary
Coordinator,
Manthan Adhyayan
Kendra.

Expressing his thoughts about the webinar with a very rich and diverse discussion, he thanked MRC for organizing such a unique opportunity. He further gave his history with the Brahmaputra, being born in Narmada and interested in hydropower development and inland waterways with his career in the Brahmaputra basin. He further stated three key points summarizing the webinar..

1. Elements of development also bring risk to the existing environment and ecology along with rising inequality. We need to be careful while planning infrastructure to develop plans and make sure that it does not conflict with the ecosystem of the region.
2. Climate risk is a major upcoming issue and it is important to study the impact that comes along with hydropower infrastructure such as siltation issues along with framing adaptation strategies for upcoming hazards.
3. The Brahmaputra basin is greatly under-researched, and there is a need for study on groundwater and spring shed management and frameworks like UDA can assist in that..

Concluding, he recommended a way forward by more collaboration and integration of issues as well as the mitigation strategies for better management of upcoming risks and opportunities.



Dr Himanshu Kulkarni
Executive Director &
Secretary ACWADAM.

Dr Himanshu, while complementing MRC for its work, began his remarks by shedding some light on ACWADAM's work with its relevance to river basins like the Brahmaputra.

He further added that ACWADAM is a think-tank-like organization, which works towards creating partnerships and collaboration on action-based research with aquifer mapping while providing training, policy recommendation, and programs for community development.

By giving a brief note on the river systems in India and how the Brahmaputra is a unique river among them, as the mainstream of the river bends and flows through many nations with various climate zones and has diverse hydro geomorphology and millions of springs.

He further added that the Brahmaputra has the most diverse aquifer system, which is less exploited in terms of groundwater. However, due to the recent developments of population rise and demands we are seeing not only the issue of groundwater abstraction but also an increase in the level of groundwater contamination.

In conclusion, he recommended that we need a good groundwater management framework for the Brahmaputra basin, incorporating and focusing on various aspects with an integrated approach including components of water quality, spring shed management, sub-aquatic groundwater discharge studies with aquifer river system, and ecosystem-based approach.

Remarks by Special Invitees



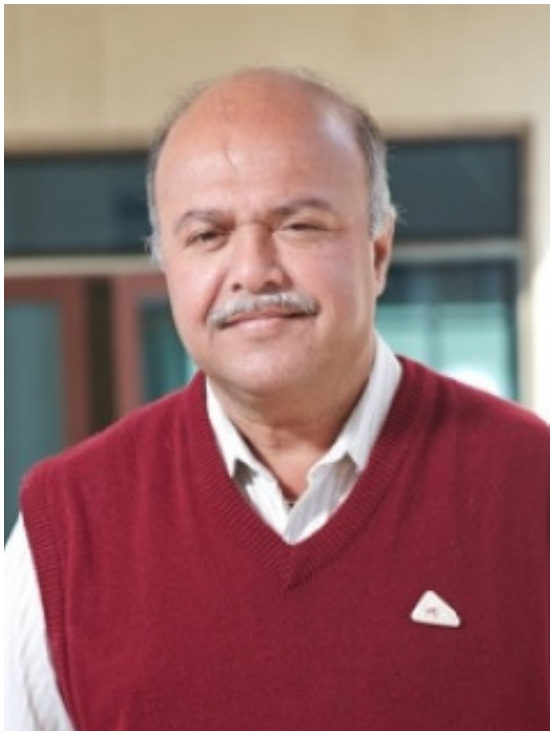
Shri Jayant Singh
Vice Chairman,
Inland Water Transport
Authority of India.

Shri Jayant Singh started by complementing the webinar and stating how important these types of dialogues spreading awareness about the upcoming issues and opportunities needed in the river system. He further elaborated on how inland water transport authority not only works towards developing transport infrastructure but also towards the sustainability of the river. IWT is currently the fastest-growing board in India and looks after development as well as ecology.

He further added how inland water transport mitigates the issues with land acquisitions and is more ecofriendly than land transport, while also being very relevant in the northeast for connecting various regions not only in terms of economic growth but also in the context of national security. He further

highlighted that inland water transport authority is not only making the waterways more manageable but also working towards enhancing the augmentation of the community by assisting in bringing opportunities for local employment by enhancing transportation for job commute.

Concluding his remarks, he highlighted that inland water transport authority by developing tunnels and road terminals along the river is easing transportation on highways. He further added that there are a lot of challenges in terms of hydrological and civil engineering context and recommended that there is a need for a lot of research and development like integration of solar panels on this infrastructure to make them more sustainable and he hopes to see more and more innovative designs and ideas in future.



Prof Ajay Dandekar
Shiv Nadar University
(SNU), Greater Noida

Professor Ajay began by expressing his gratitude to have this opportunity to participate in such a dialogue, further started highlighting a few key issues of the Brahmaputra, from the livelihoods to the climate risk, exploring the potential of the river in terms of river transport and the massive challenges of siltation and flooding.

Moving forward, he raised a few points relevant to the Brahmaputra, starting from thinking of the unthinkable, as this is a crucial aspect of strategy development. He gave the example of America's error in Pearl Harbor in the context of not even thinking in terms of whether the Japanese could mount such a massive attack on the aircraft carriers, though this was brought up during war exercise, it was further neglected by the high command. Applying this thinking in terms of Brahmaputra, he acknowledged that this unthinkable does have a framework including the fact that both India and China are water-scared along with the possibility of China becoming a Hegemon and the upcoming climate risk. Moving forward he elaborated that if considering these facts, there are issues for China as in how they are going to address the water crisis, how they are going to mitigate climate risk, and how they are going to reach their renewable energy goals.

He further added that there are many arguments, challenges as well as opportunities in the Brahmaputra. As we cannot ensure water security without ensuring river security, we need more research in terms of understating the risk we are facing due to China's development plans and following up on it by developing mitigation strategies to act on it.



Shri Jagdish Kadam
CEO Rajpath Infracon

Shri Jagdish Kadam appreciated this webinar's approach and gave compliments about the speaker's dialogues. He spoke about Rajpath Infracon and how they are involved in the infrastructure development of India. They are now including inland waterways in their plan for the future. He further expressed his happiness that his organization has collaborated with MRC to build national capacities and capabilities. He stated how they are taking forward talks on inland water transport at various levels with a core focus on littoral waters, with strategies depending on research and development.

Remarks by Hosts



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

Dr Arnab began by thanking speakers and participants for attending the webinar, followed by the presentation explaining the underwater domain awareness framework and its new perspective and opportunities bringing not only the marine domain but also the river systems like the Brahmaputra.

Highlighting further, the opportunities UDA would bring for the Brahmaputra basin being a transboundary river influences the national security long with the economic demand and growth people around. While the conservation and prevention of ecosystems play a huge role in river management. An integrated approach like UDA can help to bring all the

components together for developing a comprehensive policy and tools for sustainable management of the river.

Further, he added, projects undertaken by MRC that display the potential of the UDA Framework, Dr Das emphasized the numerous applications of the UDA Framework across the maritime domain.

He concluded by suggesting the following way ahead:

- a) The UDA framework should be accorded national priority; MRC is well placed to play a major role as a think tank for technology-driven policy advocacy. Policymakers in the coastal states need to be apprised of the UDA framework and its nuances.
- b) A Centre of Excellence may be set up for effective realization of the UDA framework with a specific focus on research, academic programs, skill development, innovation, and policy formulation.
- c) A three-tier strategy of outreach, engagement, and sustain may be taken on priority to drive the UDA framework for the effective realization of the SAGAR vision. The UDA framework should be included in forums like IORA, BIMSTEC, G-20, G-07, Indian Ocean Commission, and others.



Ms. Ananya Malik
MRC Research Associate

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.

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 Jan 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 Himangshu Sekhar Das IAS, Chief Information Officer, Government of Assam.
- 1620 hrs- Introductory Remarks on the UDA Framework and the River Systems. Dr(Cdr) Arnab Das, Founder & Director MRC, Pune.
- 1640 hrs- River Brahmaputra and the Water Quality Management Perspective. Dr. Arup Misra, Chairman Assam Pollution Control Board.
- 1720 hrs- Climate Change & Impact on the Brahmaputra, Prof Anamika Barua, Dept of Humanities & Social Sciences, IIT Guwahati.
- 1740 hrs- Challenges & Opportunities in Ground Water Management. Dr. Himanshu Kulkarni, Executive Director & Secretary ACWADAM.
- 1800 hrs- CSR and Community Engagement. Dr. Pranab J Pattar, CEO Global Foundation.
- 1820 hrs- Special Interventions: Shri Jayant Singh, Vice Chairman Inland Water Transport Authority of India. Prof Ajay Dandekar, Shiv Nadar University (SNU), Greater Noida. Shri Jagdish Kadam, CEO Rajpath Infracon.
- 1840 hrs- Closing Remarks and Way Ahead. Shri Shripad Dharmadhikary, Coordinator Manthan Adhyayan Kendra.
- 1900 hrs- Vote of Thanks by Ms Ananya Malik, MRC Research Associate (Brahmaputra).

Convenor

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ESTEEMED GUESTS



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Chief Information Officer,
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DR. ARUP MISRA
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DR. HIMANSHU KULKARNI
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SPECIAL INVITEES



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Vice Chairman,
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PROF AJAY DANDEKAR
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SHRI JAGDISH KADAM
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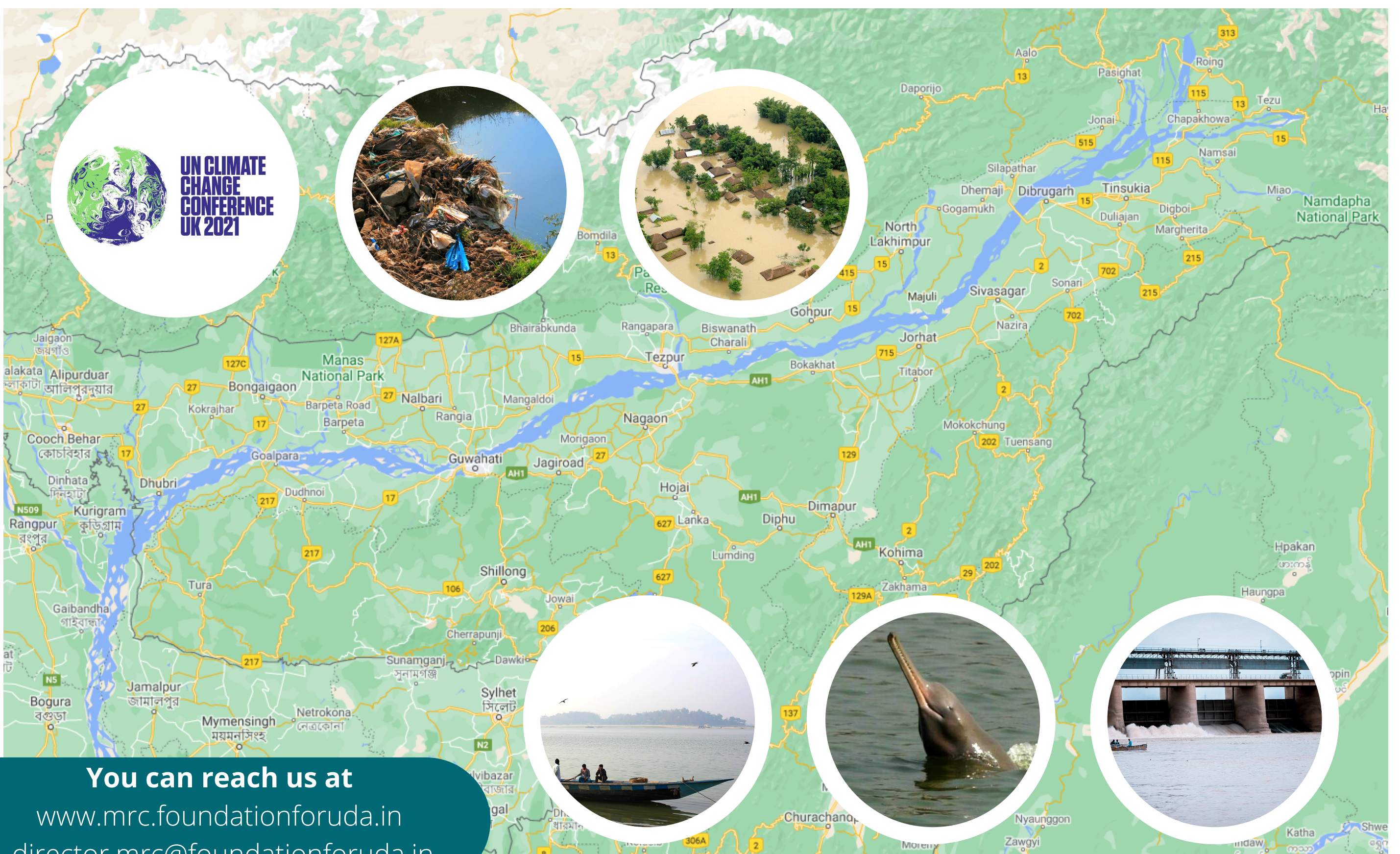


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