MRC Research Advisory Board Meeting (RAB)/03 – 23

WEBINAR

REPORT

22nd August, 2023 | 1030hrs

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Executive Summary

This report presents an overview of the Maritime Research Centre's (MRC) initiatives, focusing on the Underwater Domain Awareness (UDA) Framework. As India approaches the G20 Summit in 2023 and positions itself as a maritime nation, the significance of the maritime domain in terms of strategic security and sustainable growth has come to the forefront. The government's emphasis on the blue economy and maritime security underscores the need for a comprehensive approach to underwater domain awareness.

The UDA Framework, a collaborative effort between the Maritime Research Centre (MRC) and M/S NirDhwani Technologies Pvt. Ltd. (NDT), aims to understand and address the activities occurring in underwater marine and freshwater systems. This framework not only supports safe and secure growth in the Indo-Pacific region but also aids in combating climate change, a critical issue impacting both underwater and on-land ecosystems.

Proposing to establish a Research Advisory Board (RAB), MRC seeks to integrate key stakeholders from various sectors such as security, blue economy, environmental regulation, disaster management, science, and technology. The RAB's primary objective is to facilitate informed discussions on underwater domain awareness and its vital aspects. This initiative aligns with the broader goal of constructing a holistic livelihood enhancement ecosystem while fostering a well-structured environment for sustainable water ecosystem utilization and strategic security development.

MRC's Research Advisory Board consists of accomplished members from diverse fields including strategic security, marine history, academia, and technology. The hosts, including the Blue Economy Task Force at FICCI, Chair Amb Anup k Mudgal and Dr. Arnab Das, Founder & Director of MRC, emphasize collaboration and expertise as they guide the development of the UDA Framework.

The presentation delivered comprehensive insights into MRC's initiatives, highlighting the formalization of the Research Advisory Board, interactions with stakeholders, and the importance of addressing the challenges posed by tropical waters. The strategic positioning of India, especially regarding the blue economy policy, is stressed. Key outcomes include the recognition of underwater domain significance, youth engagement, tackling tropical water challenges, diverse expertise integration, and India's strategic global position.

Enclosures provide detailed information about the UDA Framework, the program schedule, the composition and objectives of the Research Advisory Board, as well as comments from RAB members and hosts. The report underscores the significance of the UDA Framework in promoting sustainable growth and holistic approaches in underwater domain awareness, positioning India as a key player in the maritime domain's governance and security.

Background

Over the past 75 years since independence, India has laid a strong foundation, and now is the time to take bold strides into the future, especially when India plans to host the upcoming G20 Summit in September 2023. *In the 21st century, India is emerging as a maritime nation with a significant strategic push for maritime capacity and capability building*. There has been a significant shift towards the maritime domain in the areas of strategic security and sustainable growth, and the government is placing a high priority on the blue economy and maritime security. Therefore, India stands at the brink of a remarkable transformation today, with both global and domestic cues highly favourable and we as a nation seem to be in a sweet spot. The country is perfectly poised to embark on a new phase of growth, owing to favourable political, economic, demographic, socio-cultural, and other circumstances.

About the UDA Framework:

The Underwater Domain Awareness (UDA) Framework, in a more specific sense describes the desire to know what is happening in the underwater parts of both marine and freshwater systems. The UDA framework, which was initiated and is driven by the Maritime Research Centre (MRC) in collaboration with M/S NirDhwani Technologies Pvt. Ltd. (NDT), has received widespread recognition for promoting safe, secure, and sustainable growth in the tropical waters of the Indo-Pacific region. *It encourages the pooling of resources and synergizing of efforts across the stakeholders and has devised technology tools to support livelihood for the coastal & riverine communities.*

Significance of the Indo-Pacific space:

The Indo-Pacific strategic space has gained substantial relevance in the last five years due to multiple reasons ranging from political, socio-economic, military, and more. The geopolitical and geo-strategic developments have a significant bearing on the maritime interaction between the nations in the region and also the extra-regional powers. *The political and socio-economic realities of the region encourage non-state actors to be active in the region and also the state using these non-state actors as regular instruments of state power.*

Significance of UDA to combat climate change:

The events caused due to climate change are not only impacting what you see on land but they also impact lives that remain underwater, in deep seas, rivers, and oceans. The developments underwater have also contributed immensely towards causing extreme events on land. Thus, there is a requirement for climate change studies that can be undertaken as part of the UDA Framework. *This decade has been declared the "Decade of Ocean Sciences for Sustainable Development" by the United Nations*. It is crucial for local communities to be actively involved in the development process in order to achieve Sustainable Development Goals (SDGs) in a true sense.

Proposal

The UDA framework transcends the security discourse and integrates all key stakeholders including the security apparatus, blue economic entities, environmental regulators & disaster management authorities, and science & technology providers, to facilitate the pooling of resources and synergizing efforts for ensuring safe, secure, sustainable growth for all in the region. *With that in focus, the Maritime Research Centre (MRC) proposes to initiate setting up a Research Advisory Board (RAB) as an initiative to integrate all key stakeholders and create a platform for discussions on key issues related to underwater domain awareness*

and its critical aspects. The objective of this effort will be to construct a holistic livelihood enhancement ecosystem, fostering a well-structured environment that will empower communities to harness the water ecosystem sustainably and create strategic security framework that will ensure peace & harmony.

With this initiative, MRC intends to bring together a diverse group of decision-makers from various ministries, regulators, policy advocacy groups, environmentalists, disaster management authorities, and more. Sensitization of governance mechanisms is critical and will add value to the overall policy-making process.

MRC'S Research Advisory Board Members

1. **Dr. Satheesh Shenoi**, Former Director INCOIS Hyderabad

2. **Prof Radhika Seshan**, Former HOD Department of History SPPU

3. **Dr (Cmde) Somen Banerjee**, Former Senior Research Fellow at Vivekanand International Foundation

4. **Prof Varsha Kelkar Mane**, HOD Bio-Technology Department University of Mumbai

5. **Dr. R Vijay Kumar**, Department of Ocean Engineering, IIT Chennai

6. **Dr. (Cdr) Arnab Das**, Founder & Director of Maritime Research Center, Pune

Hosts
- Amb Anup k Mudgal – Blue Economy Task Force at FICCI, Chair

- Dr. (CDR) Arnab Das – Founder & Director of MRC, Pune

- Shri. Praful Talera – MRC Adviser on Blue Economy

- Mr. Shridhar Prabhuraman – MRC Deputy Manager

- Ms. Nishtha Vishwakarma – Communication and Advocacy Lead in MRC

- J Cathrine – Research and Publication Coordinator

Outcomes

<u>**General outcome**</u>

The presentation provided a comprehensive overview of the Maritime Research Centre's (MRC) initiatives, specifically focusing on the Underwater Domain Awareness (UDA) Framework. The speaker highlighted the significance of formalizing the Research Advisory Board (RAB) and acknowledged recent interactions with key stakeholders. They emphasized the importance of addressing the unique challenges of the tropical waters and engaging the younger generation. The strategic positioning of India in the 21st century, particularly concerning the blue economy policy, was underlined. Ongoing projects, collaborations, and the integration of various disciplines in understanding and tackling underwater challenges were also discussed.

<u>**Key Outcomes**</u>

Formalization of Research Advisory Board (RAB): The establishment of the RAB signifies a structured approach to enhance the impact of MRC's initiatives, promoting collaboration and expertise.

Recognition of Underwater Domain Significance: The presentation underscored the recognized importance of the underwater domain and identified the need to bridge the expertise gap in addressing its challenges.

Youth Engagement and Academic Collaboration: The involvement of over 100 IIT students and 200+ BITS Pilani students demonstrates successful engagement with the younger generation. Collaboration with international institutions and universities further supports knowledge exchange.

Tackling Tropical Water Challenges: The speakers highlighted the unique challenges of tropical waters and the necessity to develop specialized expertise to address them effectively.

India's Strategic Position: The presentation emphasized India's crucial role in the 21st century, particularly in relation to the blue economy policy, positioning the country as a global player in underwater governance.

Diverse Expertise Integration: The initiative promotes collaboration among experts from data science, domain knowledge, and field deployment, fostering a multidisciplinary approach to solving underwater challenges.

Holistic Vision: The integration of research, innovation, skilling, curriculum development, and policy formation under a center of excellence framework signifies a comprehensive strategy to drive positive change in the underwater domain.

Global Engagement: The presentation highlighted interactions with international stakeholders, diplomats, and institutions, showcasing India's increasing influence and contributions in the underwater field at a global level.

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 explore and exploit them for economic gains effectively and efficiently. 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.
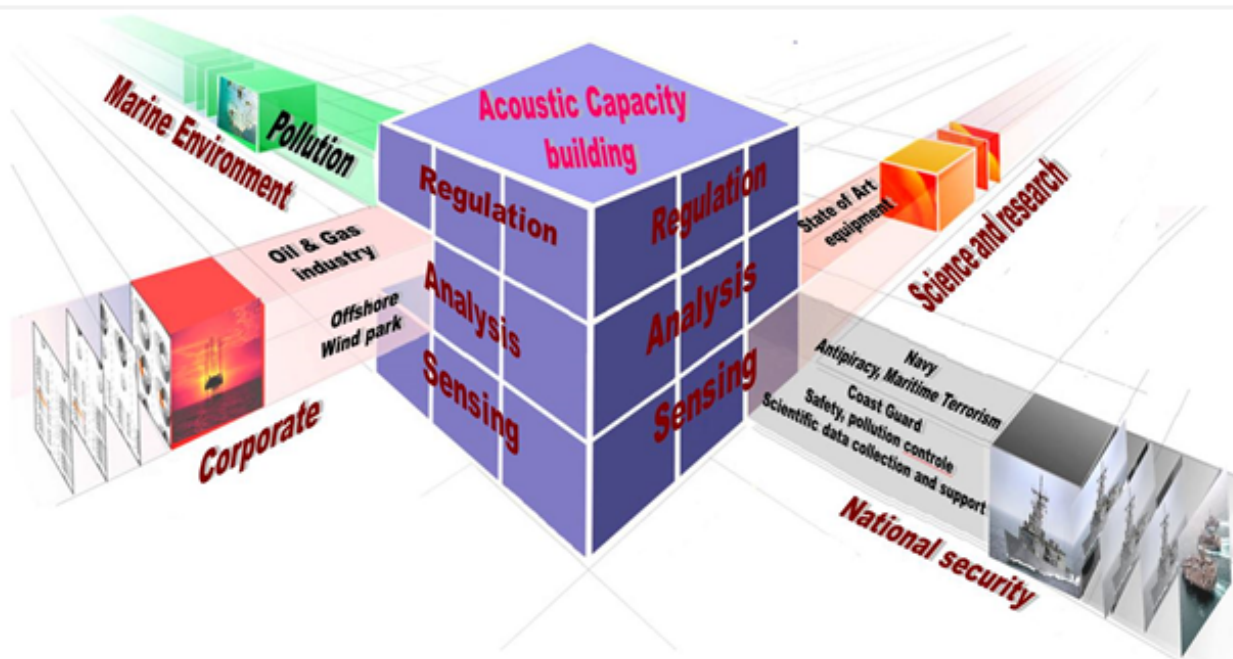

Fig. 1 Comprehensive Perspective of Undersea Domain Awareness

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/.

Research Perspective for UDA

The research perspectives in Underwater Domain Awareness (UDA) encompass a range of areas, notably focusing on sustainable development and ocean science. Actionable expertise is employed to comprehend and quantify the effects of human activities on the ocean's delicate ecosystem. Investigations delve into the evolving dynamics of ocean physics, chemistry, and biodiversity, assessing their implications for local communities. A key goal is devising science-based solutions to enhance preparedness and emergency response strategies, particularly concerning events like tsunamis and harmful algae blooms.

In the realm of national security, research endeavors concentrate on identifying vulnerabilities and understanding shifts within the security landscape. Collaborative efforts with partners yield insights into quantifying strategic changes on both regional and national levels. Engaging the private sector fosters heightened security awareness and exploration of norms pertaining to security practices. Active involvement with local communities fosters a two-way exchange of information to effectively address security concerns. Crisis advisories are disseminated to agencies and local authorities, while national risk assessments are developed, encompassing contingencies for major risks, including those associated with military and commercial technologies.

The imperative to monitor the strategic environment and inform security strategies drives a comprehensive analysis of foreign policies, strategic alliances, and partnerships. This, in turn, contributes to insightful reports furnished to security agencies. Addressing gaps in both national and international legal frameworks and policies is a crucial endeavor, often culminating in articles and discussions aimed at bridging these disparities. Further, the generation of ideas and concept papers for sponsor-driven projects serves to invigorate innovative solutions to security challenges.

Within the domain of acoustic capacity building, an array of strategies are executed to bolster expertise in underwater acoustics. Notably, efforts are directed towards identifying avenues for self-reliance in underwater repair and manufacturing capabilities, in line with the Atmanirbhar Bharat initiative. Engaging with governmental bodies such as NIOT, MOES, MOD, MEA, and MOPSW plays a pivotal role in garnering support for initiatives related to underwater domain awareness. This includes stimulating security studies and innovation, meticulously considering their intricate intersections with geopolitics, national security, and international relations. The cultivation of acoustic capacities is undertaken through identifying existing talent and capacities in the field, fostering mentorship programs, hosting workshops and seminars, and encouraging productive tech collaborations with laboratories. As a testament to fostering innovation, support is extended to patent applications and startup ventures that pertain to the expansive realm of underwater acoustics.

Programme Schedule:

Date: 22 August 2023 (Tuesday)

Time: 10:30 am IST onwards

Mode: Online webinar

Key details

- **10: 30- 10: 40 am IST: Welcome address by Amb Anup Mudgal**, Former Indian Ambassador to Mauritius and currently Co-chairing FICCI's Blue Economy Task Force

- **10: 40- 10: 50 am IST: Remarks by Dr (Cdr) Arnab Das**, Founder, and Director- MRC and NDT

- **10: 50- 11:00 am IST: Address by Shridhar Praburaman**, Dy Director at MRC on 'Research and Innovations at MRC and NDT'

- **11: 00- 11: 10 am IST: Remarks by J. Catherine**, MRC Research Coordinator on 'Research Publications'

- **11:10-11: 20 am IST: Remarks by Divya Rai**, MRC International Coordinator on 'Multilateral and Bilateral Collaborations'

- **11: 20- 11: 30 am IST: Remarks by Nishtha Vishwakarma**, Communications and Advocacy Lead on 'UDA Digest- Digital Platform that Showcases the Body of Work'

- **11: 30- 12: 00 noon IST: Remarks by Dignitaries.**

- **12: 00- 12: 30 pm IST: Closing remarks by Research Advisory Board**

- **12: 30- 12: 35 pm IST: Vote of Thanks by Shri Praful Talera**

RAB (Research Advisory Board)

The Maritime Research Centre (MRC) has initiated the establishment of a Research Advisory Board (RAB) as a key component of their Underwater Domain Awareness (UDA) Framework. The RAB aims to integrate prominent experts and stakeholders from diverse backgrounds to create a platform for informed discussions and decision-making concerning underwater domain awareness and its critical aspects.

Objectives and Role:

The RAB's primary objective is to foster discussions and decisions on underwater domain awareness, security, sustainability, policy-making, and technology advancement. As a diverse group of decision-makers, the RAB will guide and advise MRC on strategic directions, research focus, technology integration, and policy formulation in the underwater domain.

Significance:

The RAB serves as a vital platform for combining expertise, exchanging insights, and collectively driving efforts towards safe, secure, and sustainable growth in the underwater realm. By bringing together experts from academia, security, policy, technology, and environmental disciplines, the RAB will contribute significantly to holistic decision-making and the advancement of the UDA Framework.

The RAB's establishment underscores MRC's commitment to multidisciplinary collaboration, enhancing underwater domain awareness, and ensuring the wellbeing of coastal and riverine communities while aligning with national and international sustainable development goals.

Comments by RAB members and Hosts

Amb Anup Mudgal reflected on the longstanding challenge of aligning research and policy tracks. Drawing from his past experience as a diplomat, he identified a fundamental issue wherein policies seek immediate solutions to problems, while research often focuses on creating an enabling environment rather than specific solutions. He emphasized the importance of understanding practical challenges society faces and finding simple solutions. He believes that connecting research to societal solutions can bridge the gap between these tracks. He characterized MRC as a solution-oriented institution and encouraged focusing on solving real-world problems within its domain. He cited the centrality of the human factor in all endeavors and discussed the growing feeling of insecurity due to various factors, including conventional and climate-related reasons. He stressed the role of science in providing an understanding of risk and diminishing fear through scientific comprehension of problems. The speaker underscored the need for research to provide sustainable solutions, ultimately attracting policy attention.

Dr. (Cdr) Arnab Das expressed his gratitude and introduced the Research Advisory Board (RAB) of the Maritime Research Centre (MRC). He emphasized the need for a formal structure to enhance the initiative's impact. He highlighted the recognized importance of the underwater domain, while acknowledging the existing expertise gap. He appreciated the team's efforts and the involvement of numerous students, underlining the unique challenges of tropical waters. He introduced plans for the advisory board related to strategic, industry, and sustainability aspects. The critical role of India in the 21st century was acknowledged, especially regarding the blue economy policy. Ongoing projects, such as data analytics and field deployment, were discussed, along with plans to involve coastal communities and develop experts in data science and domain knowledge. He also discussed the concept of a center of excellence that integrates research, innovation, skilling, academic curriculum, and policy. He touched upon collaborations with international institutions, innovations, and the engagement of the diplomatic community. In summary, he underscored the need for formalization, collaboration, and expertise in addressing challenges and opportunities in the underwater domain. The emphasis is on holistic approaches, integration of disciplines, and active engagement with both the younger generation and established stakeholders.

Dr. Satheesh Shenoi who has been associated with MRC for several years acknowledged the remarkable expansion of MRC's activities in various domains beyond ocean acoustics. He commended the presentation by Shridhar on MRC's diverse projects and activities. He provided several suggestions: firstly, he advised MRC to focus and specialize in specific areas to distinguish itself from other institutions. He requested for a detailed presentation starting with project objectives and concluding with achievements and future plan for the next Research Advisory Board (RAB) meeting. Secondly, he suggested distinguishing MRC's work from other institutions, particularly in areas like shrimp culture and deep-sea mining, by highlighting unique aspects or approaches. He suggested potential collaborations with institutions like CMFRI and NIOT as the next step. He also recommended focusing on climate change risk and regional implications, impacting local populations and aiding policy decisions. Thirdly, he proposed concentrating on marine spatial planning and acoustic ship detection, emphasizing MRC's unique contributions in these domains. He suggested investigating the economic impact of climate change on aquaculture and bridging the gap between researchers and policymakers to make scientific findings more actionable. He concluded by encouraging MRC's vast stakeholder network to facilitate the science and policy gap for more effective outcomes.

Prof. Radhika Seshan appreciated the ongoing efforts and wished success for the continuation of the work. Emphasizing her perspective, she stressed the importance of not only addressing the present circumstances but also delving into history, particularly in the context of riverine and coastal communities. She emphasized the significance of understanding both continuity and change—how transformation is integrated within established patterns.

While admitting her unfamiliarity with engineering aspects, she underscored the necessity of historical insights into submerged areas and changes brought about by factors like global warming, mentioning the effects of plankton and algae expansion on underwater and community life. She also highlighted that discussions of security strategy should not overshadow the fundamental aspect of human interaction with the oceans throughout history. She stressed that a community-centric approach is essential, requiring engagement with and understanding of communities. This engagement extends not only to riverine but also coastal communities, such as fisherfolk and their traditional technological practices. She mentioned the importance of understanding upstream and downstream linkages, and how one must use these insights to contribute to holistic research and development.
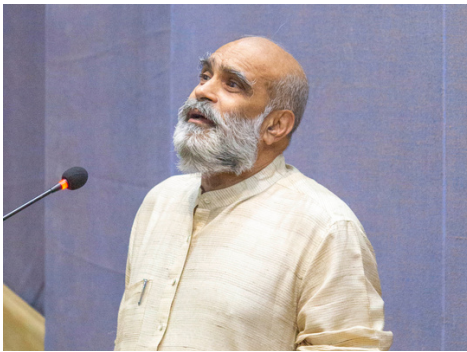
Dr. (Cmde) Somen Banerjee acknowledged the outstanding work of researchers showcased in the presentations. Drawing from his experiences in the Indian Navy and International Relations, he underscored the vast potential within the underwater domain. He highlighted two key focal points: firstly, the concept of "sustainable peace," which amalgamates sustainable development goals with the imperative of human security, particularly relevant amid global conflicts where individuals are increasingly at the forefront. The speaker highlighted the governance and normative gaps in conflict resolution and lauds institutions like MRC for establishing norms that evolved into international regulations and policy. Secondly, he introduced the national security perspective, leveraging a template from UNESCO, encompassing the comprehension of vulnerabilities, quantification of security shifts, risk assessment, advisory roles, environmental monitoring, governance gap bridging, tool management, and the encouragement of studies and innovations. In conclusion, he underscored the significance of converting these discussions into concrete research outcomes at MRC, presenting his recommendations, and expressing gratitude for the opportunity.

Dr. Vijay Kumar commended MRC's efforts in building under water domain awareness and executing joint projects with various colleges and universities.

On behalf of MRC, **Shri Praful Talera** expressed gratitude to various fellows and interns involved in a research project related to water and underwater domains. He thanked Ambassador Mudgal for emphasizing the need for practical solutions. He appreciated the support from various individuals, Sridhar, Catherine, Nishtha, and the team. The speaker reflected on the growth of the project, from a small team to a group of 30 people, under the leadership of Dr. Arnab Das.

He emphasized the importance of understanding water, a global commons, and highlighted that sound, particularly sonar, is crucial for this understanding.

The RAB members and other advisors were unanimous in their instructions that there is a massive awareness and skill gap and disconnect among the policymakers, stakeholders and practitioners about the UDA framework and its relevance to the governance mechanism. They were convinced that the UDA framework has to be fast tracked to achieve the objectives of the geopolitical and geostrategic priorities like the SAGAR vision of the Honorable Prime Minister. India's economic growth and prosperity along with the strategic security concerns can only be realized with effective implementation of the UDA framework across all the stakeholders, namely national security, blue economy, environment, disaster & climate change risk management and science & technology. They applauded the comprehensive and inclusive approach by MRC driven UDA framework.
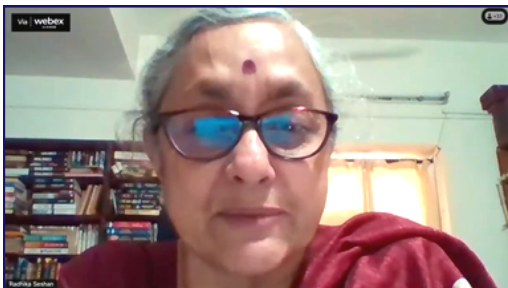
Glimpses from the Webinar

Amb Anup k Mudgal

Dr. Satheesh Shenoi

Prof. Radhika Seshan

Cmde Somen Banerjee

Dr (Cdr) Arnab Das

Shri Praful Talera

Mr. Shridhar Prabhuraman

Ms. Nishtha Vishwakarma

WEBINAR FOR
REVIEW OF UDA RESEARCH & INNOVATION ACTIVITIES BY MRC'S RESEARCH ADVISORY BOARD (RAB)

MRC'S RESEARCH ADVISORY BOARD

DR. SATHEESH SHENOI
Former Director,
INCOIS

PROF. RADHIKA SESHAN
Maritime Historian

CMDE SOMEN BANERJEE
Strategic Security Expert

PROF. VARSHA KELKAR MANE
University of Mumbai

DR. R VIJAY KUMAR
IIT Chennai

HOSTS

AMB ANUP K MUDGAL
Blue Economy Task
Force at FICCI, Chair

SHRI. PRAFUL TALERA
MRC Adviser on
Blue Economy

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

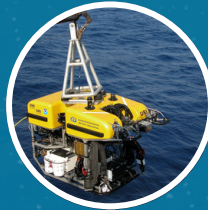**MR. SHRIDHAR PRABHURAMAN**
MRC Deputy Director

J. CATHERINE
Head
Research & Publication

MS. NISHTHA VISHWAKARMA
Communications and
Advocacy Lead, MRC

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