

# Workshop Report

## Three Workshop Series

### Institutionalized Skilling Ecosystem for Enhanced Realization of the SAGAR Vision

*A New Perspective based on the  
UDA Framework*

06 Mar 2023 to 24 Mar 2023

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# EXECUTIVE SUMMARY

The broad aim of the workshop series was to sensitize the policy makers, stakeholders, practitioners, academia, researchers and the young India, to achieve the desired objective of institutionalizing the skilling ecosystem. The demographic bulge in India, needs to be channelized to make sure the young India is ready for the future opportunities. The synergy among the varied entities involved in the skilling and knowledge ecosystems is critical.

The Security And Growth for All in the Region (SAGAR), vision of the Honourable Prime Minister is a paradigm shift, in the way India deals with the global order and also internal matters. The global community is looking at the Indo-Pacific strategic space as the geopolitical and geostrategic center of gravity. The Indo-Pacific construct is a maritime concept, but requires significant appreciation of the unique tropical conditions. The SAGAR vision articulates the security concerns and the blue economic opportunities. It is well known that India, suffered from a continental mindset in policy making and needs massive capacity & capability building across multiple dimensions, to ensure rekindling our maritime consciousness. Geopolitically, India is making the right kind of moves to be taken seriously by the global powers in all forums. The internal systems also need to keep pace with our global ambitions. Mega initiatives have been announced to make sure the SAGAR vision is supported, and also national missions have been announced to complement the mega projects.

The maritime push and the digital transformation can open a completely new direction for the Young India to find meaningful engagement and contribute to nation building. A new initiative today has to be aligned to the global expectations of sustainable development, climate change resilient, socio-economically & socio-culturally sound and more. Such complex demands will require nuanced approach that is comprehensive and inclusive. The policy & technology interventions and capacity & capability building have to go hand in hand. Optimum utilization of assets is a critical

In the past, we have been importing critical underwater technologies at a very high cost from the west. However, the imported technology is not suited for the tropical waters and needs serious customization in our waters. The fragmented approach among the stakeholders, is a major limitation in pooling of resources and synergizing of efforts for indigenization. Site specific field experimental R&D is highly resource intensive and thus in the absence of a collaborative approach, the resources will never be enough.

The Underwater Domain Awareness (UDA) framework as proposed by the Maritime Research Center (MRC), is designed to address the challenges and opportunities in the tropical waters of the Indo-Pacific strategic space. India has a huge opportunity to play a leadership role in the ongoing global order. The SAGAR vision is well aligned to equip India to be a global player in the ongoing geopolitical and geostrategic reality. The skilling and knowledge initiatives have to match-up to meet these requirements at all levels. India can develop these specialized capabilities for its own students and young professionals, and then support nations in the region.

# BACKGROUND

India stands at the brink of a remarkable transformation today, with both global and domestic cues are highly favourable and we as a nation seem to be in a sweet spot. The country appears to be perfectly poised to embark on a new phase of growth, owing to favourable political, economic, demographic, socio-cultural, and other circumstances. Over the past 75 years since independence, India has laid a solid foundation, and now is the time to take bold strides into the future. 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. The Honourable Prime Minister's vision of "The Security And Growth for All in the Region (SAGAR)" envisages India as a leader in the entire Indian Ocean region (IOR) and beyond. To realize this vision, it will be crucial to invest in building the necessary capacity and capabilities building at multiple levels.

The tropical littoral waters of the Indian Ocean region (IOR) present a unique set of challenges and opportunities that demand a tailored, local indigenous driven approach. Previous attempts at importing technology and knowledge from the West have fallen miserably. It is noteworthy that there is a significant potential for resources and opportunities in both marine and freshwater underwater ecosystems waiting to be utilized, but these areas require specialized expertise and cannot be viewed as a mere extension of the maritime surface. Science and technology (S&T) will play a crucial role in driving new initiatives, and it is imperative to cultivate indigenous, site-specific Research and development Development (R&D) efforts focused on addressing real-world problems through field experimentation and validation.

The Underwater Domain Awareness (UDA) framework has received widespread recognition for promoting safe, secure, and sustainable growth in the tropical littoral waters of the Indo-Pacific region. The Digital Ocean construct supported by the UDA framework, will significantly enhance good maritime governance. It encourages pooling of resources and synergizing of efforts across the stakeholders and has devised technology tools to support livelihood for the coastal communities. The Indo-Swiss Center of Excellence has partnered with the MRC to establish a skills training initiative to further encourage the UDA framework across various line sectors.

This decade has been declared as 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 the Sustainable Development Goals in a true sense. This initiative is supported by the HT Parekh Foundation to build an institutionalized mode.

# PROPOSAL

It is proposed to launch a series of outreach and engagement programs for sensitization and institutionalization of robust skilling ecosystem to drive the UDA framework. The objective of this effort is to construct a holistic livelihood enhancement ecosystem, fostering a well-structured environment that will empower communities to harness the water ecosystem sustainably and create sustainable livelihood prospects. The workshops, each of the three, concentrated on one particular aspect of the ecosystem building initiative.

(a) **Policy Intervention:** This was hosted to build on the entire spectrum of policy formulation. Both regional and national aspects were deliberated and a roadmap for the future was devised. A clear emphasis on skilling for livelihood enhancement was also emphasized. Participants from diverse backgrounds viz. humanities and liberal arts gathered to deliberate on the larger social engineering aspects and community level interventions from an institutionalization stand point. Key decision makers presented to identify gaps for policy interventions. The five-day workshop was divided into the following facets:

- (i)The geopolitics and the geostrategic perspective
- (ii)The traditional knowledge and opportunities for scaling
- (iii)The governance mechanisms and required intervention
- (iv)The capacity & capability building
- (v)The structured institutionalized framework

(b) **Technology Intervention:** This was hosted, with a focus on exploring the role of science and technology as a catalyst for livelihood enhancement. The emphasis was to build sustainable development interventions to augment traditional knowledge, rather than replacing the traditional practices with modern tools. The key objective was to leverage technology tools to improve governance and increase efficiency. The five-day workshop was divided into the following aspects:

- (i)The Digital Ocean Framework.
- (ii)The Sustainable Development Goals.
- (iii)The Data Science Framework.
- (iv)The infrastructure gaps.
- (v)The multi-disciplinary and multi-functional structure.

(c) **Grassroots Community Engagement:** This initiative was hosted at the Konkan coast and involved collaboration with multiple partners from both the government and private sectors to engage with the coastal communities. Representatives from various grassroots communities, such as aquaculture, pisciculture, diving, shipbuilding and more, were convened in their respective community establishments for hands-on exposure.

The two-day classroom interaction encompassed aspects of policy and technology interventions along with acoustic capacity, and capability building. Feedbacks from participants were solicited during this phase. The three-day field visit encompassed the following sectors:

- (i) Aquaculture.
- (ii) Pisciculture.
- (iii) Underwater diving.

The last day will consist of a debrief and a feedback session for the entire three-day workshop, including interaction with authentic community representatives.

# PARTICIPATION

The participants for the workshop series came from diverse stakeholders and practitioners. These include:

- The **Indian Navy**, deputed four officers from important strategic departments.
- The **Indian Coast Guard**, deputed four officers from different regions.
- The **Indian Army**, deputed two officers from different formations.
- The **Marine Police Maharashtra**, deputed two officers involved in coastal policing in the Konkan coast.
- The **Military Institute of Technology**, a tri-services training institute for the defence forces, deputed seven officers including two faculties.
- The **National Defence Academy (NDA)**, deputed four officers engaged in instructional duties.
- The **L&T Defence**, deputed five senior officials.
- The **Bharat Forge**, deputed three officials.
- The **Institute of Marine Engineers (IME)**, deputed four students from Cochin University of Science and Technology (CUSAT), Kochi.
- The **College of Engineering Pune (COEP) Technology University** deputed five faculty and twenty students from multi-disciplinary departments.
- The **DY Patil Campus Akurdi**, deputed five faculty and twenty students from multi-disciplinary institutes.
- The **Symbiosis Institute of Media & Communication**, deputed ten students as volunteers to participate and help in the event management.
- The **Vishwakarma Institute of Information Technology (VIIT)**, deputed ten students.
- The **Dynamic Logistics**, deputed five officials.
- Approximately ten **Indian Navy** and **Merchant Navy** veterans attended the event on a regular basis.
- Even **educationalists managing schools** joined us occasionally to get a sense of the new domain.
- Multiple **research scholars** pursuing their post graduate and PhD research joined us for the event.
- Even members of the **start-up ecosystem** from the Bhau Institute Pune, joined us occasionally to understand the new opportunities.
- The **online participations** was very diverse and unique from across the globe. Around 200 registrations were observed and approximately 30 average participations was observed all the time. Participants included serving officers from the Sri Lankan Navy, Merchant Mariners, Students, Environmentalists, Research Scholars and more.

At the conclusion of the program, each participant received a certificate of successful completion. As part of the program requirements, every participant has submitted a comprehensive evaluation of their experience. The five most noteworthy write-ups were recognized and rewarded at the grand closing ceremony. Student participants also had the opportunity to earn a fellowship at MRC based on their performance during the program.

# OUTCOMES

## GENERAL OUTCOMES

The UDA framework is relevant to a multitude of stakeholders, but often lacks cohesive collaboration across governance mechanisms. To overcome this issue, pooling of resources and harmonization of efforts across stakeholders and policy makers will be crucial. The entire ecosystem needs to be managed in a comprehensive manner. The livelihood enhancement initiative must be managed holistically, not just through skilling, but through management of the entire ecosystem at various levels. This proposal aims to address all levels and stakeholders in a comprehensive manner as follows:

- The **policy interventions** will bring together a diverse group of decision makers from various ministries, regulators, policy advocacy groups, environmentalists, disaster management authorities and more. By providing **actionable inputs**, the ecosystem will mature and thrive. Sensitization of governance mechanisms is critical and will add value to the overall policy making process.
- The **science and technology** will always drive growth and governance, but local solutions for the ecosystem are challenging. **Digital transformation** will play a significant role in governance mechanisms to bring value to skilling initiatives in multiple ways. Improving infrastructure, building capacity and capabilities, conducting Research and Development (R&D), and more will require a nuanced approach, and can also generate significant **livelihood opportunities**.
- To ensure the validity of the framework, it must be tested and refined through **engagement with the communities** on the ground. This requires a cyclical iterative process of communication and collaboration between the planners and all relevant parties, in order to finalize a comprehensive plan that addresses the needs and concerns of the communities. Concerns of the communities and assurance to the communities that the governance mechanism cares, is extremely critical.
- The effective **ecosystem management** will require a multi-disciplinary and multi-functional framework. **Institutional** approach will require a massive pool of skilled and knowledgeable human resource to manage the ecosystem at multiple levels. This initiative will kick start this process. This initiative will serve as a catalyst for this process and provide a foundation for a nuanced structure.
- Women will be ambassadors in promoting and advancing this initiative in the future. Through **interaction with the communities** and a two-way feedback will provide a significant role in strengthening the initiative and driving its success. By positioning women as leaders and drivers of the ecosystem, **true women empowerment** will be achieved.



## KEY OUTCOMES

The workshop series looked at the global, regional and national level interactions to sensitize the decision makers, and also get their inputs to fine tune our own initiatives. The program had the following aspects covered to institutionalize the skilling ecosystem:

**Policy Intervention:** The policy intervention at multiple levels are critical and all of them must be aligned to make sure coherence. The following aspects were covered:

**Global Level:** The United Nations (UN), has declared this (2021-2030) as the decade of the Ocean Sciences for Sustainable Development. The Inter-Governmental Ocean Commission (IOC) is spearheading this global initiative. The other partners are UNESCO, IMO, ISA and others at the global level. All these organizations are UN entities with specific mandates to build a better world for the future.

IOC Executive Secretary, **Dr. Vladimir Ryabinin**, interacted with the participants and gave a global perspective on the ocean initiative. MRC fellow, also made a presentation in his presence on the Marine Spatial Planning (MSP), developed by MRC.

His Excellency **Shri Jawed Ashraf**, India's Ambassador to France, joined the workshop online from Paris and made a very insightful presentation on the Indo-Pacific and the strategic outlook for India in the new global order. He also discussed in details, how the SAGAR vision is aligned to the new global order. Shri Jawed Ashraf was at the Prime Minister Office (PMO), when the SAGAR vision was conceived.

The UNESCO India Head of Natural Sciences, **Dr. Neha Midha**, made a detailed presentation on the initiatives in the Indian sub-continent. She addressed issues of community engagement and traditional practices, in the context of environmental conservation.

The European Union (EU) as a block is one of the major entity shaping global order. Indo-EU collaboration is thus, important for India's relevance in the global power play. His Excellency **Shri Raj Kumar Srivastava**, India's Ambassador to Croatia made a detailed presentation on the subject. He also stressed on the merits of Indo-Croatian partnership on maritime capacity building.

**Dr. David Brewster**, from the Australian National University, spoke on the Indo-Pacific strategic partnership and also the Indo-Australian Strategic Maritime partnership. He reiterated that the UDA framework has significant potential to contribute towards the ongoing geostrategic developments.

**Shri Kishore Mandya**, former adviser to the UN Secretary General, gave a broad overview of decision making at the UN and other global organizations.

**Cmde Somen Banerjee**, is a known International Relations expert and has a deep understanding of the Non-Traditional Threat (NTT) in strategic security domain. He mentioned the role of the UDA framework in managing the NTT.

**Shri Neeraj Panchal**, is a patent councilor working with an American multi-national company. He gave a insightful perspective on innovation and the requirement of intellectual property protection.

**National Level:** The SAGAR vision of the Honourable Prime Minister is aspirational and also in tune with the global trends. The SAGAR vision is getting complemented by massive push by the Government of India, on multiple counts.

**Amb Anup Mudgal**, was India's ambassador to Mauritius, when the Honourable Prime Minister declared the SAGAR vision at Port Louis, Mauritius in May 2015. He is presently a member of the Prime Minister's Blue Economy Committee and also the FICCI Blue Economy Task Force.

**Lt Gen V G Khandare** (Retd), Adviser to the Ministry of Defence and former Military Adviser to the National Security Adviser (NSA) addressed the participants on the civilizational heritage and a nuanced way ahead based on the traditional knowledge.

**Shri Hemang Jani**, Secretary Capacity Building Commission (CBC), is responsible for empowering the 30 million government servants across the center and the states to enhance their skills, knowledge and attitude, to achieve enhanced governance in the country. CBC works directly under the Prime Minister's office and Shri Hemang Jani was posted as the Officer on Special Duty (OSD) at the PMO, when the SAGAR vision was announced.

**Shri Avinash Mishra**, Senior Adviser (Water Resource) at the NITI Aayog presented the larger freshwater management challenges and opportunities.

**Dr. Deepak Samuel V**, from National Center for Sustainable Coastal Management (NCSCM), under the Ministry of Environment, Forest & Climate Change, made a very detailed presentation on the efforts from their center on regulating the coastal regions.

**Capt Sudhir Subedar**, former DG Shipping and IMO official talked about the larger trends in the seafaring and also the Inland Water Transport (IWT), issues. He highlighted the massive capacity & capability building gaps in the IWT at multiple levels.

**Dr. Swayamprabha Das**, climate change expert and IUCN member. She is a Fulbright Scholar with a PhD on International Relations. She spoke on the UDA framework as a driver for climate change assessment and mitigation.

**Ms. Lakshmi Krishna Kumar**, spoke on the synergy between art and science and how to make the world more inclusive. She gave a detailed appreciation of the ancient Indian knowledge and how it is still relevant in the modern times.

**Local Level:** The local level policy makers also have a significant role to play. Three former Presidents of the Maratha Chamber of Commerce, Industry and Agriculture (MCCIA), joined the event. **Shri Pratap G Pawar**, **Shri Pradeep Bhargava** and **Shri Mukesh Malhotra** addressed the participants.

**Academia :** The academia was adequately represented by senior academicians and researchers.

- **Prof Anamika Barua**, Politics & Economics and Dean of Students at IIT Guwahati,
- **Prof Mukul S Sutaone**, Vice Chancellor of College of Engineering Technology University at Pune and Digital Signal Processing Expert,
- **Dr. Apoorva Palkar**, Vice Chancellor at Maharashtra Skill University,
- **Prof Ajay Dandekar**, Historian and Strategic Expert at Shiv Nadar University,
- **Prof Radhika Seshan**, Maritime Historian and expert on Traditional Knowledge at Savitribai Phule Pune University,
- **Dr. R Vijay Kumar**, Naval Architect and Associate Prof at IIT Chennai, is a former naval officer with over two decades of naval service and R&D experience for ocean related aspects.
- **Rear Admiral Amit Vikram (Retd)**, Campus Director at D Y Patil Akurdi Campus, is a former naval officer with over three decades of service.

**Technology Intervention :** The technology intervention at multiple levels and diverse field are critical.

Experts from across six dimensions of technology, critical for achieving the digital transformation discussed fundamental issues:

- **Dr. Satheesh C Shenoj**, Emeritus Scientist Ministry of Earth Sciences and former Director of INCOIS and NIOT, is a known scientist dealing with the Digital Oceans initiative of the Government of India.
- **Dr. Ashish Kuvelkar**, from CDAC Pune is also the member of the National Supercomputing mission and he spoke on the High-Performance Computing (HPC),
- **Dr. L Venkata Subramaniam**, Heads IMBs Quantum Computing initiative in India,
- **Mr. Manas Diwan**, is an expert on Metaverse,
- **Mr. Shridhar Prabhuraman**, is an expert on Underwater AI and data analytics. He is the technical lead at MRC.
- **Shri Anis Pankhania**, is a cyber security expert at the Capgemini Technology Services India Limited.

**User Perspective:** The user perspective is critical and we had multiple user representatives:

- **Lt Gen D B Shekatkar (Retd)**, Chairman of the Shekatkar Committee that worked on the re-structuring & modernization of the armed forces,
- **Vice Admiral DSP Varma (Retd)**, former Chief of Materiel in Indian Navy and then the Director General of the Strategic Submarine Project,
- **Vice Admiral Ajay Kochhar**, Commandant National Defence Academy,
- **Additional Director General Vijay D Chafekar (Retd)**, Indian Coast Guard,
- **Shri Jayant Umranikar (Retd), IPS** Former Director General of Police Maharashtra, in-charge of coastal policing,

**Industry Perspective:** The industry representatives from entities trying to support the UDA framework spoke on the challenges and opportunities.

- **Shri Arun T Ramchandani**, Executive Vice President of L&T Defence participated in the workshop 2. L&T has been supporting the defence & aerospace sector at multiple levels including building the indigenous strategic submarine.
- **Shri Ashwin C Shroff**, Chairman Excel Industries came down to spend a day with the participants. The Excel Industries has been driving the Seaweed Cultivation in India in a very major way, as their CSR activity.
- **Shri Praful Talera**, Managing Director Dynamic Logistics has been geopolitics and geoeconomics expert.
- **Cmdr Uday Talwelkar (Retd)**, represents Bharat Forge who are heavily invested in the defence & aerospace industry.
- **Shri Vikram S Puri**, Group President & CEO POSHS Group, working on multiple high-end communication and networking solutions for the defence forces.
- **Ms. Devleena Bhattacharjee**, Climacrew is a unique CSR initiative of the Excel Industries, Pedilite Industries and Mamta Group. Climacrew is deeply involved in seaweed cultivation at multiple levels of policy, innovation and community engagement.

**MRC Fellows Presentations:** Multiple MRC research fellows presented their work to the participants.

- **Mr. Sanskar Soni** A third year student from IIT Delhi is working on building the MSP framework across multiple applications.
- **Ms. Rishika Khanna** A final year student from IIT Delhi is working on the sediment transport study in the tropical waters for three cases, namely the Brahmaputra, Jawaharlal Nehru Port Trust and the coastal management in the Konkan Coast.
- **Mr. Romit Kaware** A final year IIT Delhi student is working on the sediment classification studies in the tropical waters for three cases, namely sediment bearing pressure, benthic ecosystem assessment and abiotic object identification.
- **Mr. Slok Nemani** A final year IIT Bombay student working on the digital tool for the coastal and riverine communities. The tool will allow effective management of Shrimp farming and seaweed cultivation.
- **Mrs. Cathrine J** She is working on the Indus River management with a focus on the UDA framework for enhanced governance. She is an Alumna of St Stephan's College, Ashoka University and Shiv Nadar University.
- **Ms. Shelja Alawadi** She is a research scholar at TERI Institute of Advanced Studies working on realizing the Sustainable Development Goals (SDGs) for the freshwater systems, driven by the UDA framework.
- **Ms. Nishtha Vishwakarma** She is the editor of the UDA Digest that has a repository of over 70 articles, covering multiple aspects of the UDA framework.

# INSTITUTIONAL OUTCOMES

The MRC has proposed few concrete measures to achieve the [institutionalized skilling ecosystem](#) for realizing the SAGAR vision. The way ahead has to be structured to achieve a concrete outcome.

**Outreach** This workshop is the beginning of outreach to sensitize the ecosystem on the merits of the UDA framework towards realizing the SAGAR vision. More such targeted workshops, seminars and conferences will be required to get more people onboard. A structured outreach will be required at regular intervals to sensitize the large section of students, young professionals, policy makers, stakeholders, practitioners and others.

- **UDA Summer School** A five weeks internship program is planned wef 12 Jun 2023. It will be a project-based program with field experiment, expert interaction and industry exposure. The participants will come from academia, industry, stakeholders and policy makers.
- **UDA Internship** An eight-week internship is planned in May, June and July for the students from premier institutes interested in research and innovation. MRC gets regular applications from IITs, BITS Pilani and other premier institutes for summer internship. The focus here is project-based learning with high research and innovation content.
- **Short Seminars** A set of one day, two-day and five-day seminars will be conducted for multiple stakeholders and policy makers. The seminars will be for domestic and global audience. The Ministry of External Affairs (MEA) is processing a case for connecting the Indian Ocean Rim Association (IORA) nations. The Capacity Building Commission (CBC) is organizing a series of workshops for multiple government officials across the center and state. CBC has also tasked MRC to build e-learning modules for varied stakeholders.

**Engage** The outreach has to translate to engagement with the multiple components of the ecosystem. This step will bring more involved engagement to ensure deeper appreciation of the nuances of the UDA framework to enable them to drive it to the next level.

**UDA Fellowship:** The students and young professionals found suitable to contribute further during the outreach interactions will be offered UDA fellowships. Three types of fellowships are on offer:

- UDA Project Fellowship is a part-time five-month engagement for students and young professionals. They are paid a monthly stipend for their contribution.
- UDA Theme Fellowship is a one-year fulltime program for young professionals. Even research scholars can join.
- UDA Research Fellowship is a deliverable based program with more serious outcome expectations.

**Stakeholder Engagement** The stakeholders, including academia, industry, users and practitioners have started signing MoUs with MRC to drive the UDA framework for their specific requirements. Capacity & capability building to more specific policy & technology interventions for their strategic requirements.

**Strategic Engagement** The policy makers at the central and state level need to engage with the UDA framework. A comprehensive and inclusive mechanism needs to be evolved with the existing structures.

**Sustain** The outreach and engage steps must evolve into more tangible policy & technology interventions for realization of the SAGAR vision on the ground. Specific project proposals will be submitted to get funding and recognition from the authorities for implementing the projects. A mix of corporate, CSR and government support will be sought to make it a collaborative and synergized mechanism of nation building.

**Policy Intervention:** Specific UDA related global, regional, national and local policy interventions need to be formulated to achieve the desired outcomes. The policy draft with well-informed research and innovation inputs will require dedicated effort and expert involvement. Such efforts cannot be undertaken by private citizen without the support of the appropriate authorities. MRC has been tasked by the International Maritime Organization (IMO) through the Government of India to work on Underwater Noise Management in the tropical waters of the IOR. It started with a body of work generated by MRC on their own for over five years, before it got picked up by the Government of India. Similar such work will be required for multiple other sectors for realizing the Sustainable Development Goals (SDGs) in the IOR and beyond.

**Technology Intervention:** Marine Spatial Planning (MSP) as part of the digital transformation in the underwater domain has become the de-facto tool for effective governance in the marine and freshwater systems. The digital transformation in the tropical waters has its unique challenges and requires site specific R&D efforts to build the deeper understanding of the local ground realities. Even mapping of the traditional knowledge onto the modern digital tools will be an effective way forward. Project proposals for building the hardware and software for such digital transformation tools. Multi-disciplinary researchers have to get involved to build this knowhow with adequate funding made available from diverse sources.

**Sector Skill Council :** The National Skill Development Council (NSDC) has been reached out to consider setting up of a sector skill council dedicated to the UDA framework. The initiative will help building a structured User-Academia-Industry partnership with government support. India under the SAGAR vision aspires to export skilling and knowledge to the nations in the neighborhood and this step will be an effective way ahead.

**Center of Excellence:** Setting up of a center of excellence with five sub-centers namely research, academia, skilling, incubation and strategy will go a long way in bringing enhanced governance into this new initiative. It will also attempt to align it with the global, regional, national and local frameworks. The balance between people, economy and nature will be the prime focus of this center of excellence.

# ENCLOSURE 1 | UDA FRAMEWORK

## 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.

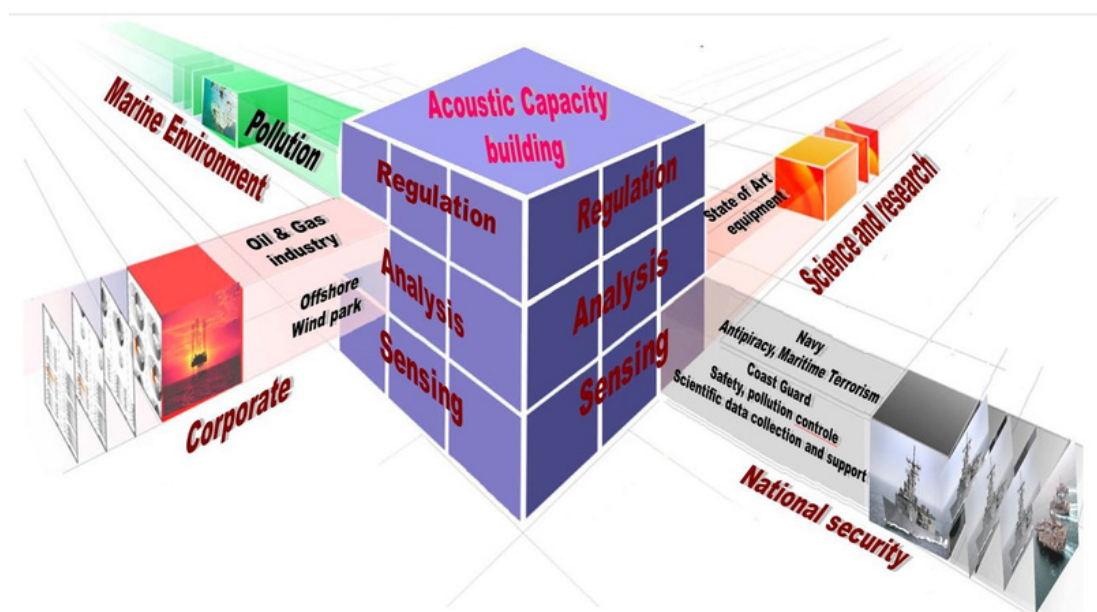


Fig. 1 Comprehensive Perspective of Undersea Domain Awareness



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/>.

## **ENCLOSURE 2 | PARTNERS**

### **MARITIME RESEARCH CENTER**

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.

### **HT PAREKH FOUNDATION**

The H T Parekh Foundation is the philanthropic arm of Housing Development Finance Corporation Limited (HDFC), India's leading mortgage lender and a well - established financial conglomerate. Since inception, HDFC had financed 8.4 million families to acquire their own home, and has emerged as a financial conglomerate with the group's presence in the banking, asset management, insurance (life & general), real estate venture capital and education finance.

### **INDO – SWISS CENTER OF EXCELLENCE**

ISCE is a not for profit organisation registered under section 8 of the companies Act 2013. The vision of the organisation is to impart highest standards of skills training by applying Swiss Vocational Education System (Swiss VET). Swiss VET is acclaimed as one of the best in the world. The Dual Track System places significant emphasis on hands-on working in companies, with the industry framing the curriculum, qualification standards and examinations.

## **CLIMA CREW**

Clima crew is working towards scaling seaweed production and consumption through the use of data, technology and social engineering. Clima Crew aims to make India a significant player in the global seaweed space by creating systematic and sustainable supply to fulfill demand opportunities across various industries.

## **IISDA**

MTDC's Indian Institute of Scuba Diving and Aquatic Sports (IISDA) is India's first integrated Scuba diving school located next to the Tarkarli Beach giving breathtaking view of Arabian Sea with dedicated scuba training pool with max depth of 25 ft. IISDA is a leader in the Scuba Diving Industry in India and is one of the few PADI 5 star certified dive centers in the country. Their qualified diving instructors, world-class diving equipment, and world-class infrastructure ensure that IISDA divers have a truly memorable diving experience. IISDA is proud to have certified over 500 Air Force personnel in strategic scuba diving courses over the last 5 years.

# ENCLOSURE 3 | WORKSHOP DESIGN

## Workshop-1

The policy intervention will require deliberations from a spectrum of domain experts, strategic thinkers, industry bodies and others. The following program has been formalized:

### Day-1 (06 Mar 2023)

- 0930 hrs - Inaugural Session
- 0930 hrs Welcome Address by [Mr. Mukesh Malhotra](#)
- 0940 hrs Opening Address by [Prof Mukul S Sutaone](#),
- 1000 hrs Introductory Remarks by [Dr\(Cdr\) Arnab Das](#)
- 1050 hrs Remarks [Shri Pradip Bhargava](#)
- 1110 hrs Concluding Remarks by [Amb Anup Mudgal](#)
- 1130 hrs Vote of Thanks
- 1130 hrs - High Tea
- 1200 hrs - Detailed Presentation on the UDA Framework  
[Dr \(Cdr\) Arnab Das](#)
- 1330 hrs - Lunch Break
- 1430 hrs - Detailed Presentation on Socio-Political Framework  
[Prof Anamika Barua](#), IIT Guwahati
- 1600 hrs - Tea Break
- 1630 hrs - Interactions & Conclusion
- 1730 hrs - Day End

### Day-2 (07 Mar 2023)

- 0930 hrs - Skilling Ecosystem and Challenges  
Panel Discussion  
[Amb Anup Mudgal](#), FICCI Task Force - Chair  
[Dr. Apoorva Palkar](#), Vice Chancellor Skill University  
[Prof Anamika Barua](#), IIT Guwahati  
[Dr\(Cdr\) Arnab Das](#), Founder & Director MRC  
[Shri Praful Talera](#), GC Member – SSC Strat Manuf
- 1100 hrs - High Tea
- 1130 hrs - Plenary Session – Blue Economic Perspective  
[Amb Anup Mudgal](#), FICCI Task Force  
Chaired by [Shri Ashwin Shroff](#), Excel Industries

- 1300 hrs - Lunch Break  
 1400 hrs - CRZ Management and the Challenges  
[Dr. Deepak Samuel V](#), NCSCM Chennai  
 Chaired by [Shri Ashwin Shroff](#), Excel Industries  
 1500 hrs - Tea Break  
 1530 hrs - Seaweed Cultivation in India  
[Ms. Devleena Bhattacharjee](#), Climacrew Team  
 1630 hrs - Project Presentation by MRC Fellows  
[Mr. Shlok Nemani](#) – Shrimp & Seaweed Cultivation  
[Ms. Shelja Alawadi](#) – Sustainable Development Goals  
 1730 hrs - Day End

### Day-3 (08 Mar 2023)

- 0930 hrs - Maritime History & Traditional Knowledge  
[Dr. Radhika Seshan](#), Maritime Historian  
 1100 hrs - Tea Break  
 1130 hrs - Marine Spatial Planning from a Global Perspective  
[Dr. Vladimir Ryabinin](#), Exec Secretary of IOC UNESCO  
 1230 hrs - MRC Project Presentation on Marine Spatial Planning  
[Mr. Sanskar Soni](#), IIT Delhi  
 1300 hrs - Lunch Break  
 1400 hrs - Choke Points and the Global Order - [Shri Praful Talera](#)  
 1530 hrs - Tea Break  
 1600 hrs - Project presentation by MRC Fellow  
[Ms. Nishtha Vishwakarma](#) – UDA Digest  
 1700 hrs - Day End

### Day-4 (09 Mar 2023)

- 0930 hrs - Interaction and Conclusions  
 1000 hrs - MRC Project Fellow Presentation  
 Sediment Transport – [Ms. Rishika Khanna](#)  
 1100 hrs - Tea Break  
 1130 hrs - Brahmaputra and the Inland Water Transport  
[Capt Sudhir Subedar](#), Former DDG Shipping  
 1300 hrs - Lunch Break  
 1400 hrs - Detailed Presentation Marine Biosphere Reserves  
[Dr. Neha Midha](#), Head Natural Sciences, UNESCO India  
 1500 hrs - The SAGAR Vision and the New Global Order  
[His Excellency Shri Jawed Ashraf](#), Ambassador of India to France  
 1600 hrs - Tea Break  
 1630 hrs - Interactions & Conclusions  
 1730 hrs - Day End

## Day-5 (10 Mar 2023)

- 0930 hrs - Water Resource Management and Rural Livelihood  
[Prof Ajay Dandekar](#), President BRLF
- 1100 hrs - High Tea
- 1130 hrs - Climate Change and the UDA Framework  
[Dr. Swayamprabha Das](#)
- 1300 hrs - Lunch Break
- 1400 hrs - Plenary Session – India's Capacity Building Plan  
[Shri Hemang Jani](#), Secretary Capacity Building Commission (CBC),  
Government of India & [Shri Himansu Pandey](#), CBC Government
- 1500 hrs - Remarks by Dignitaries  
[Capt Sudhir Subedar](#), Former DDG Shipping  
[Vice Admiral DSP Varma \(Retd\)](#), Former DG ATVP  
[Shri Pratap Rao Pawar](#), Chairman BOG COEP  
[Shri Hemang Jani](#), Secretary CBC Gol.
- 1530 hrs - Tea Break
- 1600 hrs - Interaction & Conclusion
- 1700 hrs - Workshop Ends

## Workshop-2

The technology intervention will require deliberations from a spectrum of domain experts, strategic thinkers, industry bodies and others. The following program has been formalized:

### Day-1 (13 Mar 2023)

- 0930 hrs - Inaugural Session  
0930 hrs Welcome Address by [Vice Adm DSP Varma \(Retd\)](#)  
1000 hrs Introductory Remarks by [Dr\(Cdr\) Arnab Das](#)  
1030 hrs Key Note Address [Dr. Satheesh Shenoy](#)  
1050 hrs Special Remarks by [Ms. Lakshmi Krishnakumar](#)  
1105 hrs Concluding Remarks by [Shri Kishore Mandya](#)  
1120 hrs Vote of Thanks by Shri Praful Talera
- 1130 hrs - High Tea  
1200 hrs - Presentation on High Performance Computing  
[Dr, Ashish Kuvellar](#), CDAC Pune
- 1330 hrs - Lunch Break  
1430 hrs - Quantum Computing and the New Horizon  
[Dr. L Venkata Subramaniam](#), IBM India
- 1600 hrs - Tea Break  
1630 hrs - MRC Project Presentation on Marine Spatial Planning  
[Mr. Sanskar Soni](#), IIT Delhi  
MRC Project Presentation on Sediment Transport  
[Ms. Rishika Khanna](#), IIT Delhi
- 1730 hrs - Day End

### Day-2 (14 Mar 2023)

- 0930 hrs - Innovation and Start-up Ecosystem  
Panel Discussion  
[Vice Admiral DSP Varma \(Retd\)](#) – Chair  
[Dr. R Vijay Kumar](#), IIT Chennai  
[Cmde Uday Talwelkar \(Retd\)](#), VP Bharat Forge  
[Shri Neeraj Panchal](#), John Deere
- 1100 hrs - Tea Break  
1130 hrs - Presentation on Underwater Robotics  
[Dr. R Vijay Kumar](#), IIT Chennai
- 1300 hrs - Lunch Break  
1400 hrs - Evolution of the UDA Framework Globally  
[Dr\(Cdr\) Arnab Das](#), Founder & Director MRC
- 1530 hrs - Tea Break  
1600 hrs - MRC Project Presentation on Sediment Classification  
[Mr. Romit Kaware](#), IIT Delhi  
MRC Project Presentation on Indus River Basin  
[Ms. Catherine J](#)
- 1730 hrs - Day End

### Day-3 (15 Mar 2023)

- 0930 hrs - Metaverse and the Possibilities  
[Mr. Manas Dewan](#), Brand Kiln
- 1100 hrs - Tea Break
- 1130 hrs - Freshwater Ecosystem and the Challenges  
[Shri Avinash Mishra](#), Senior Advisor NITI Aayog
- 1300 hrs - Lunch Break
- 1400 hrs - MRC Project Presentation on APY Analysis  
[Mr. Shlok Namani](#), IIT Mumbai
- 1500 hrs - Feedback from the Participants on the Way ahead
- 1530 hrs - Tea Break
- 1600 hrs - Detailed Presentation Non-traditional Security threats  
[Cmde Somen Banerjee](#), Strategic Security Expert
- 1730 hrs - Day End

### Day-4 (16 Mar 2023)

- 0930 hrs - Indo-Pacific and the IOR – Challenges & Opportunities  
[Dr. David Brewster](#), SRF Australian National University
- 1100 hrs - Tea Break
- 1130 hrs - Detailed Presentation National Security Challenges  
[Lt Gen V G Khandare](#) (Retd), Adviser Min of Defence
- 1300 hrs - Lunch Break
- 1400 hrs - The India-EU Strategic Maritime Collaboration  
His Excellency [Shri Raj Kumar Srivastava](#), India's Ambassador to Croatia
- 1530 hrs - Tea Break
- 1600 hrs - Presentation on AI & Data Analytics - UDA Framework  
[Mr. Shridhar Prabhuraman](#), MRC Deputy Director
- 1730 hrs - Day End

### Day-5 (17 Mar 2023)

- 0930 hrs - Special Session on Maritime Governance
- 0930 hrs Welcome Address by [Lt Gen D B Shekatkar\(Rtd\)](#)  
Chairman Shekatkar Committee
- 0940 hrs Opening Address by [Shri Vikram S Puri](#)  
Group President & CEO, POSHS Group
- 1000 hrs Introductory Remarks by Dr(Cdr) Arnab Das
- 1030 hrs Feedback from the participants
- 1050 hrs Chief Guest Remarks by [Vice Admiral Ajay Kochhar](#),  
Commandant National Defence Academy
- 1110 hrs Concluding Remarks by [Shri A T Ramchandani](#),  
Executive Vice President, L&T Defence
- 1120 hrs Vote of Thanks by Shri Praful Talera
- 1130 hrs - High Tea
- 1200 hrs - Maritime History - Security Perspective in the IOR, [Prof Radhika Seshan](#),  
Maritime Historian
- 1330 hrs - Lunch Break



1430 hrs - Strategic Security Challenges & Opportunities

Panel Discussion

[Shri Jayant Umranikar](#), IPS (Retd) - Chair

[Addl DG \(CG\) Vijay D Chafekar \(Retd\)](#)

[Rear Adm Amit Vikram \(Retd\)](#), DY Patil Group

[Shri A T Ramchandani](#), L&T Defence

[Shri Praful Talera](#), Dynamic Logistics

[Shri Anis Pankhania](#), Capgemini Technology Services India Limited

1600 hrs - Tea Break

1630 hrs - Interactions and Conclusions

1730 hrs - Workshop End

## Workshop-3

The community interaction will require a spectrum of entities, communities, innovative tools, mechanism of interactions and more. The following program has been formalized:

### Day-1 (20 Mar 2023)

- 0800 hrs - Proceed to Malwan by Bus
- 1630 hrs - Arrive Malwan
- 1700 hrs - Tea & Settle down in Accommodation
- 1930 hrs - Briefing for the Field Visits
- 2030 hrs - Dinner & Day End

### Day-2 (21 Mar 2023)

- 0900 hrs - Arrive at IISDA Tarkarli
- 0930 hrs - Tea Break
- 1000 hrs - Catamaran ride 20 PAX/ SCUBA Diving demonstration 20 PAX
- 1230 hrs - Lunch Break
- 1400 hrs - Catamaran ride 20 PAX/ SCUBA Diving demonstration 20 PAX
- 1700 hrs - Tea break/ Debrief and End of Day Activity

### Day-3 (22 Mar 2023)

- 0730 hrs - Leave for Taramumbari-Devgad
- 0830 hrs - Arrive at Mangrove Ecotourism site
- 0900 hrs - Mangrove boat ride 10 PAX/Kayaking 4 PAX/ Briefing on the ecotourism strategy by Mangrove Foundation staff
- 1230 hrs - Lunch Break
- 1430 hrs - Leave for Hadi (Aquaculture site and Biodiversity interpretation centre)
- 1430 hrs - Briefing on cage culture project by Mangrove Foundation Staff
- 1630 hrs - Leave for resort
- 1730 hrs - Tea Break & De-brief and end of day activity

### Day-4 (23 mar 2023)

- 0900 hrs - Arrive at IISDA conference room
- 0930 hrs - Address by MRC Director
- 1000 hrs - Presentations by Marine Researchers working in the Region
- 1230 hrs - Lunch break
- 1330 hrs - Presentations by Marine Researchers continue
- 1600 hrs - Interactions and Conclusions
- 1800 hrs - Tea Break & De-brief and end of day activity

### Day-5 (24 Mar 2023)

- 0700 hrs - Breakfast & Departure to Pune
- 1800 hrs - Arrive Pune and Close of Workshop

# ENCLOSURE 4 | PHOTO GALLERY

## WORKSHOP 1 POLICY INTERVENTION

The policy intervention workshop involved deliberations from a spectrum of domain experts, strategic thinkers, industry bodies and others.

### DAY 1

#### PRE-LUNCH



**Mr. Mukesh Malhotra**



**Prof Mukul S Sutaone**



**Shri Pradip Bhargava**



**Amb Anup Mudgal**



**Dr (Cdr) Arnab Das**

#### POST-LUNCH



**Prof Anamika Barua**

## DAY 2

### PRE-LUNCH



**Amb Anup Mudgal**



**Dr. Apoorva Palkar**



**Prof Anamika Barua**



**Shri Praful Talera**



**Shri Ashwin Shroff**

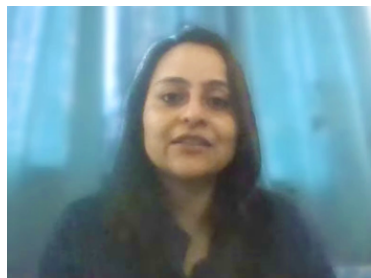


**Dr (Cdr) Arnab Das**

### POST-LUNCH



**Dr. Deepak Samuel V**



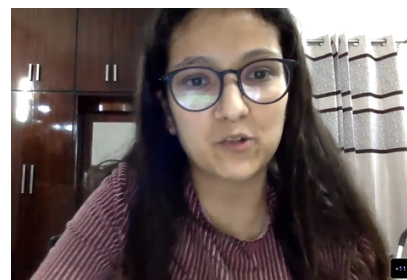
**Ms. Devleena Bhattacharjee**



**Shri Ashwin Shroff**



**Mr. Shlok Nemani**



**Ms. Shelja Alawadi**

## DAY 3

### PRE-LUNCH



**Vladimir Ryabinin**



**Dr. Radhika Seshan**



**Mr. Sanskar Soni**

### POST-LUNCH



**Shri Praful Talera**



**Ms. Nishtha  
Vishwakarma**

## DAY 4

### PRE-LUNCH

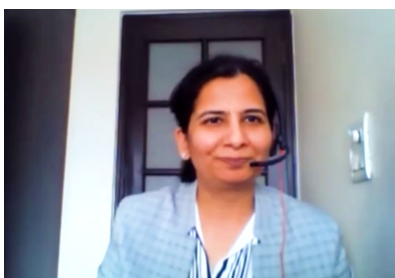


**Ms. Rishika Khanna**



**Capt Sudhir Subedar**

### POST-LUNCH



**Neha Midha**



**Shri Jawed Ashraf**

## DAY 5

### PRE-LUNCH



**Prof Ajay Dandekar**



**Dr. Swayamprabha Das**

### POST-LUNCH



**Shri Hemang Jani**



**Capt Sudhir Subedar**



**Vice Admiral DSP Varma (Retd)**



**Shri Pratap Rao Pawar**

## WORKSHOP 2 TECHNOLOGY INTERVENTION

The technology intervention workshop involved deliberations from a spectrum of domain experts, strategic thinkers, industry bodies and others.

### DAY 1

#### PRE-LUNCH



**Vice Adm DSP Varma (Retd)**



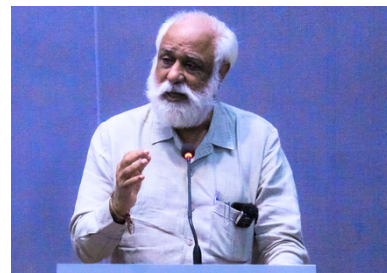
**Dr. Satheesh Shenoy**



**Ms. Lakshmi Krishnakumar**



**Dr. Ashish Kuvelkar**



**Shri Kishore Mandya**

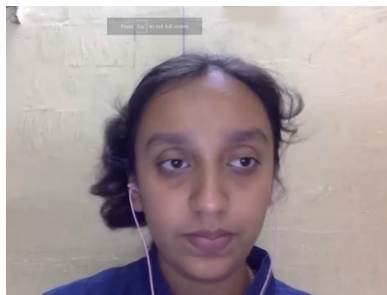


**Dr (Cdr) Arnab Das**

#### POST-LUNCH



**Dr. L Venkata  
Subramaniam**



**Ms. Rishika Khanna**



**Mr. Sanskar Soni**

**DAY 2**

**PRE-LUNCH**



**Vice Adm DSP Varma (Retd)**



**Dr. R Vijay Kumar**



**Cmde Uday Talwelkar (Retd)**



**Shri Neeraj Panchal**

**POST-LUNCH**



**Dr (Cdr) Arnab Das**



**Mr. Romit Kaware**



**Ms. Catherine J**



**DAY 3**

PRE-LUNCH



**Shri Avinash Mishra**



**Mr. Manas Dewan**

POST-LUNCH



**Cmde Somen Banerjee**



**Mr. Shlok Nemani**

**DAY 4**

PRE-LUNCH



**Dr. David Brewster**



**Lt Gen V G Khandare (Retd)**

POST-LUNCH



**HE Shri Raj Kumar Srivastava**



**Mr. Shridhar Prabhuraman**

**DAY 5**

**PRE-LUNCH**



**Lt Gen D B Shekatkar(Rtd)**



**Shri Vikram S Puri**



**Vice Admiral Ajay Kochhar**



**Shri A T Ramchandani**



**Shri Praful Talera**



**Prof Radhika Seshan**

**POST-LUNCH**



**Shri Jayant Umranikar**



**Shri Vijay D Chafekar**



**Shri Anis Pankhania**



**Dr (Cdr) Arnab Das**



**Rear Adm Amit Vikram  
(Retd)**



**Glimpse from  
Workshop 2 Day 5**

## WORKSHOP 3 GRASSROOTS ENGAGEMENT

Grassroots or community engagement was hosted at the Malvan coast to engage with the coastal communities involved in aquaculture, pisciculture, diving, shipbuilding etc.

**DAY 1**



*Visit to Indian Institute of Scuba Diving & Aquatic Sports (IISDA), Malvan and demonstration on scuba diving tools & equipments*





*Dive master Vivan explains the use of each tool and a rescue demonstration was given.*



*A fantastic Catamarine ride was organized to demonstrate how the catamarine operates, what are the scanners/ sonars fixed on it and how to navigate, detect marine mammal or obstacles using the same were well explained.*



*The ride also involved showcasing various islands around and the different spots suitable and not suitable for diving were also explained. Dolphins were also spotted along the way, which added thrill and excitement to the ride.*



*Visit to Fish Auction to see the variety of fishes being auctioned and sold at Vengurla beach of Malvan*

**DAY 2**



*Mangrove Ecotourism: Mangrove safari, Devgad*



*The Biodiversity center at Hadi village, showcased various indigenous species of birds, fishes, flowers, inserts, marine mammals', flora and fauna that were found in the district of Malvan and around.*



**Aquaculture units** where cage culture method for cultivation. Fishermen have been encouraged by the government to adopt cage culture along with fishing to support their income source as government provides 90% subsidiary for installation of first cage culture



## DAY 3



*Sindhudurg Fort is a historical fort that occupies an islet in the Arabian Sea, just off the coast of Maharashtra in Western India. The fort has a hidden passage in the temple which looks like a water reservoir. This passage goes under the fort for 3 kilometres and 12 kilometres beneath the sea and from there 12 kilometres in to a nearby village*



**Presentation by Fishermen Community Head: Mr. Mahendra Pradkar News reporter and representative of traditional the fishermen community**



**Dr Das presented various aspect of UDA framework, collective mobilization of various stakeholders for effective management of marine resources and also emphasized the role and importance of UDA in coastal protection, management and restoration.**



*Presentation by researchers at Indian Institute of Scuba Diving & Aquatic Sports (IISDA)*



*Mr. Praful Talera giving concluding remarks for workshop 3*



*Conclusion and End of Workshop 3*

# GLIMPSES FROM THE WORKSHOP



# CONTACT US

## Support MRC Initiatives



[Support MRC](#)

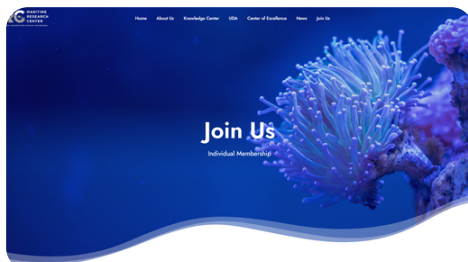
## Checkout our Digital Brochure



[Digital Brochure](#)

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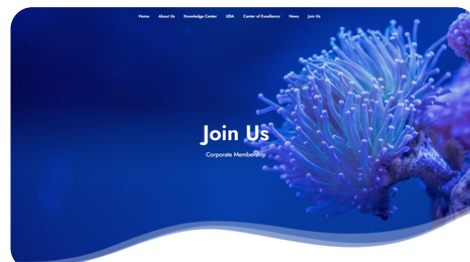
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[Mentors | Patrons](#)



[Individual Membership](#)

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[Commercial & Blue Economic Entity](#)



[Corporate Membership](#)

## Contact Information

Address: 102 Cordia, Nyati Estate, Mohammedwadi, Pune- 411060  
Email: [director.mrc@foundationforUDA\\*.in](mailto:director.mrc@foundationforUDA*.in)

## Social Connect



## Map



## Join Us

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[Academia Membership, Internship, Fellowship and Research](#)

## UDA\*

The conventional approach of each of the stakeholders pursuing their own UDA\* efforts has serious limitations given the highly resource intensive field experimental research initiative required for a long period. [Click here for more](#)