# A DECADE OF SAGAR: ALIGNING VISION WITH REALITY THROUGH UNDERWATER DOMAIN AWARENESS (UDA)

**16th April 2025, 1600 hrs – 1800 hrs IST**

In 2015, the Honourable Prime Minister of India unveiled the visionary doctrine of *Security and Growth for All in the Region* (SAGAR), placing India at the strategic and moral helm of the Indian Ocean Region (IOR). As SAGAR completes its tenth year, this milestone offers a timely opportunity to critically evaluate its impact and trajectory. More than a maritime policy, SAGAR is a call for regional leadership, sustainable development, and strategic autonomy—anchored in India's civilizational maritime legacy and forward-looking geopolitical aspirations.

Over the past decade, the Government of India has announced numerous mega projects aligned with the SAGAR vision, reinforcing India's intent to establish itself as a capable and dependable regional maritime power. However, realising this vision demands more than infrastructure—it calls for building indigenous capacity and capability tailored to the unique tropical characteristics of the IOR, which present both enormous potential and profound complexity.

An estimated 90% of resources, challenges, and opportunities in the IOR lie beneath the ocean surface. This mandates a robust framework for Underwater Domain Awareness (UDA)—a critical enabler for digital transformation, strategic security, and sustainable economic development. The UDA framework is not merely a technological innovation but a strategic imperative that can drive Marine Spatial Planning (MSP) and governance optimisation across the region.

The Maritime Research Center (MRC), Pune, in collaboration with M/s NirDhwani Technologies Pvt Ltd (NDT), has been pioneering the development and implementation of the UDA framework. Their work supports safe, secure, and sustainable maritime activity in the tropical waters of the Indo-Pacific. By integrating the four key stakeholder domains—strategic security, blue economy, sustainability & climate resilience, and science & technology—the UDA framework stands as a unique model of convergence for policy and technology interventions.

This webinar will bring together policymakers, researchers, technocrats, diplomats, and maritime professionals to reflect on the evolution of the SAGAR vision, review ongoing efforts, and explore how the UDA framework can support India's leadership in the IOR and beyond.

The objectives of the webinar are to review and reflect on ten years of the SAGAR vision by assessing its achievements, identifying existing gaps, and exploring future potential. It aims to evaluate India's maritime capability and capacity-building efforts in relation to its regional aspirations, while introducing and discussing the Underwater Domain Awareness (UDA) framework as a strategic enabler for regional leadership. The webinar will further explore the alignment of UDA with the SAGAR vision through tools such as Marine Spatial Planning (MSP), digital transformation, and indigenous innovation. Ultimately, it seeks to recommend a forward-looking roadmap to strengthen India's position and leadership in the Indo-Pacific strategic space.

The key themes of the webinar will revolve around a comprehensive evaluation of the SAGAR vision after a decade, focusing on its progress, challenges, and future direction. It will examine India's maritime capability, tracing the journey from a civilizational maritime legacy to a leadership role in the region. A central theme will be the Underwater Domain Awareness (UDA)

framework, positioned as a transformative tool for strategic security and sustainable development. The discussions will also highlight Marine Spatial Planning (MSP) as a vital mechanism for enabling digital governance in the Indian Ocean Region (IOR). Emphasis will be placed on the convergence of policy and technology as a pathway for realising the SAGAR vision, alongside fostering regional partnerships to ensure self-reliance and diminish the strategic relevance of extra-regional powers in the tropical waters of the IOR.

**Program Flow**

**1600 – 1610 hrs** | **Keynote Address: UDA Framework and the SAGAR Vision**
**Speaker:** *Dr. (Cdr) Arnab Das*

**1610 – 1620 hrs** | **Maritime Power Dynamics in the Indo-Pacific**
**Speaker:** *Prof. P. V. Rao*

**1620 – 1630 hrs** | **Strategic Security Challenges in the IOR**
**Speaker:** *Capt. Sarabjeet Parmar*

**1630 – 1640 hrs** | **Building a Sustainable Blue Economy**
**Speaker:** *Mrs. Cathrine J*

**1640 – 1650 hrs** | **Navigating Climate Change in the IOR**
**Speaker:** *Mr. Akash Prasad*

**1650 – 1700 hrs** | **Marine Spatial Planning (MSP) for Effective Governance**
**Speaker:** *Mr. Shridhar Prabhuraman*

**1700 – 1710 hrs** | **Coastal Management for Resilient Communities**
**Speaker:** *Mr. Shlok Nemani*

**1710 – 1720 hrs** | **Sediment Management and Its Strategic Importance**
**Speaker:** *Mr. Romit Kaware*

**1720 – 1730 hrs** | **Acoustic Fingerprinting in Maritime Security and Resource Management**
**Speaker:** *Ms. Pradnya*

**1730 – 1740 hrs** | **Maritime History & Indigenous Practices in the IOR**
**Speaker:** *Mrs. Radhika Seshan*

**1740 – 1750 hrs** | **The Way Ahead – 100 Warriors Initiative**
**Speaker:** *Ms. Nishtha Vishwakarma*

**1750 – 1800 hrs** | **Closing Remarks: Geopolitical Dimensions of SAGAR**
**Speaker:** *Amb. Anup K. Mudgal*

**Convener**

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**Enclosure**

# 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 underwater realm of our maritime areas and the freshwater systems. This keenness for underwater 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 access to the seas and littoral waters. The freshwater systems, particularly the transboundary Rivers, are not defended by the Navy & the Coast Guard, but these waters are equally vulnerable and more complex to manage. However, military requirements may not be the only motivation for generating underwater domain awareness. The earth's underwater geophysical activities have a lot of relevance to the well-being of humankind, and monitoring them could provide vital clues to minimise the impact of devastating natural calamities. The commercial activities in the underwater realm need precise inputs on the availability of resources to effectively and efficiently explore and exploit them for economic gains. Underwater resources include fisheries, aquaculture, seaweeds, pharma ingredients, minerals, and others with significant market value. The regulators, on the other hand, need to know the pattern of exploitation to manage a sustainable plan. The connectivity through the water bodies has been recognised as the most effective and efficient mode of transportation, however, ensuring navigability in these water bodies requires a massive amount of UDA.

With so many commercial and military activities, there is a 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 and climate change risk. The scientific and research community needs to engage and continuously update our knowledge and access of the multiple aspects of the underwater domain. The global community is looking at the Indo-Pacific strategic space for their geopolitical and geostrategic engagements. The Indo-Pacific region, by definition, is the tropical waters of the Indian and Pacific Oceans. The tropical waters present unique challenges and opportunities regarding rich biodiversity and resource availability. However, the sub-optimal sonar performance is the biggest issue, limiting the UDA in these regions. The sonars that were designed for the temperate & polar waters of the Greenland, Iceland, United Kingdom (GIUK) gap during the Cold War era suffered 60% degradation when deployed in tropical waters. The developing nations in tropical waters need to customise these technologies to suit their conditions. The Western nations that are pushing this hardware do not have the manpower to deploy it. In contrast, the tropical nations, have the manpower but lack the appreciation of the technology and the know-how. The proposed UDA Framework, presented in the figure below, can optimise resource deployment and provide nuanced policy and technology intervention, along with acoustic capacity & capability building to manage the tropical challenges and opportunities. There is significant fragmentation among all four stakeholders, namely Strategic Security, Blue Economy, Sustainability & Climate Change Risk Management, and Science & Technology (Digital Transformation), and the UDA framework provides a comprehensive way forward for the stakeholders to engage and interact.

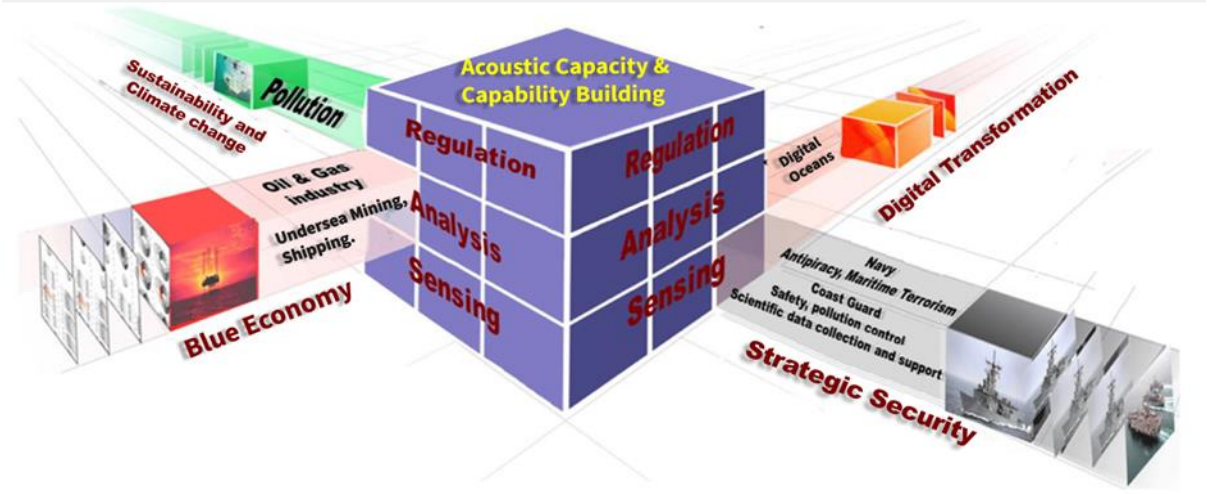


**Figure. Comprehensive Perspective of the UDA Framework**

On a comprehensive scale, the UDA Framework needs to be understood in terms of 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 underwater domain for threats, resources, and activities. The second level would be making sense of the data generated to plan security, conservation, and resource utilization strategies. The next level would be to formulate and monitor regulatory framework at the local, national, and global levels. 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 a more focused approach and a well-defined interactive framework. Given the appropriate impetus, the UDA Framework can address multiple challenges being faced by the global community today. Meaningful engagement of the young and aspirational population is probably the most critical aspect that deserves attention. Multi-disciplinary and multi-functional entities can interact and contribute to synergize their efforts towards a larger goal seamlessly.

The UDA Framework is a structured, comprehensive, and inclusive framework to drive the underwater domain effectively and efficiently. The structured approach will minimize the fragmentation among the stakeholders, regional players, national authorities, and local bodies. The multiple entities will have divergent interests and priorities, thus, converging them into one single and focused governance mechanism will be a challenge. The governance mechanism must be comprehensive and recognize all dimensions of the stakeholder requirement. The dimensions include varied layers that are instrumental in building a strong governance mechanism. The first layer would be five pillars: research, skilling, academia, innovation, and policy. The second layer is its translation into policy & technology intervention, along with acoustic capacity & capability building. The inclusive aspects include varied socio-economic, socio-political, and socio-cultural native groups in the larger governance framework. The varied socio-economic strata of the society, particularly the coastal & riverine communities,

get excluded in the conventional development models. The students need to prepare for real-world challenges and get very late before they get exposed to the nuances of real-world issues. The political spectrum is always driven by the social structure, based on left or right leanings. The governance mechanism has to address the concerns and aspirations of both sides. The cultural divide translates to the traditional practices and beliefs that drive their livelihoods and social structure. The governance mechanism has to address these divides and integrate everyone into one national, regional, or global framework.

The global community is also professing the triad of people, economy, and nature for enhanced governance mechanisms. The people component includes the livelihood, well-being of the native communities, social dynamics, and more. The economic component is the growth and prosperity associated with the activities. The nature component addresses sustainability and climate change risk management. This is also measured in terms of the Environmental, Social, and Governance (ESG) formulation. The UDA Framework is consciously addressing all these varied measures of global good parameters.