

Underwater Domain Awareness (UDA) Framework

By, Dr (Cdr) Arnab Das

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 the access to the seas and littoral waters. The freshwater systems are not defended by the Navy & the Coast Guard, but these waters are equally vulnerable and more complex to manage. However, just the military requirement may not be the only motivation to generate underwater domain awareness. The earth's underwater 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 underwater realm need precise inputs on the availability of resources to be able to effectively and efficiently explore and exploit them for economic gains. The regulators on the other hand need to know the pattern of exploitation to manage a sustainable plan. With so many activities, commercial as well as 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 underwater domain. The figure below, 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.

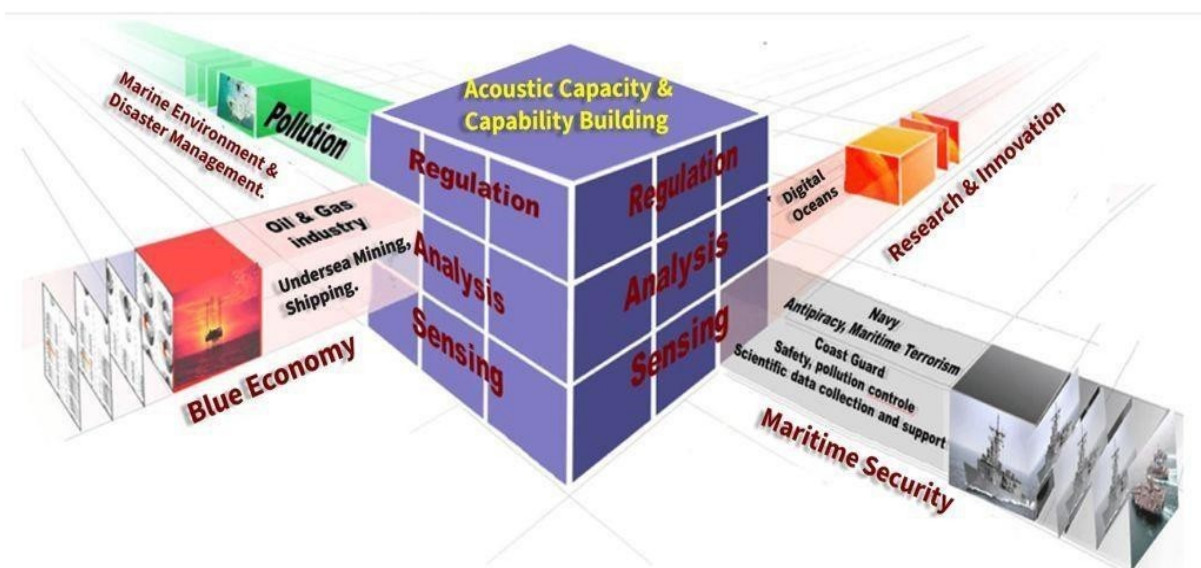


Fig. Comprehensive Perspective of Underwater Domain Awareness (UDA) Framework

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 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 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 by the author who is the founder of the Maritime Research Centre (MRC), Pune and M/S NirDhwani Technology Pvt Ltd (NDT).

More details are available in the MRC website <http://foundationforuda.in/mrc/>. This file is available at: <https://mrc.foundationforuda.in/uda-framework/UDA.pdf>

Bibliography

1. (15 July 2015) Profile of Dr Das in Moving Waters Film Festival, mentioning that he was working on UDA. <https://movingwaters.in/speaker/dr-cdr-arnab-das/>
2. Mentions the need for Underwater Domain Awareness: Last Para of Conclusion (Pg 8) Das, Arnab (2016). *Impact of maritime security policies on the marine ecosystem. Maritime Affairs: Journal of the National Maritime Foundation of India, 12(2), 8998.* doi:10.1080/09733159.2016.1246751
<http://dx.doi.org/10.1080/09733159.2016.1246751>
3. (May 2017) Article by Dr Arnab Das, in 'Geopolitics' mentioning UDA
<https://www.magzter.com/stories/News/Geopolitics/Indian-Leadership-Must-for-Indian-Ocean-Region>
4. (06 July 2017) Article by Mrs Sharda Dubey on 'The Wire' mentioning Dr Arnab Das and his work on Underwater Domain Awareness
<https://thewire.in/environment/marine-mammals-noise-pollution-naval-sonar-manapad>
5. (April 2018) UNDERWATER DOMAIN AWARENESS: A NEW PARADIGM FOR THE INDIAN OCEAN REGION, Article on SALUTE |
<https://salute.co.in/underwater-domain-awareness-a-new-paradigm-for-the-indian-ocean-region/>