

UDA Framework

for effective realization of the SAGAR vision.

A High Level Dialogue
for
National Capacity Building

REPORT

26 August 2020 | 1600hrs - 1805hrs



Covering Note



MRC/CASS/01

Aug 2020

The Maritime Research Centre (MRC), Pune in association with the Centre for Advance Strategic Studies (CASS), Pune organized a webinar on the 26th Aug 2020, titled “Underwater Domain Awareness (UDA) Framework for Effective Realization of the Security And Growth for All in the Region (SAGAR) Vision”. The event generated significant enthusiasm among the stakeholders to participate and evolve a strategic framework. The focus of the deliberations was to encourage pooling of resources and synergizing of efforts towards ensuring a Safe, Secure, Sustainable Growth in the Indian Ocean Region (IOR). The participants recognized the relevance of the UDA framework for realizing the SAGAR vision declared by the Honourable Prime Minister.

The webinar was a high level dialogue among the senior strategists and experts from the relevant fields to evolve a common strategy at the national and regional level. The panel members were unanimous in endorsing the relevance and the urgency of the UDA framework as proposed by MRC, Pune to be recognized at the policy level for effective realization of the SAGAR vision. The panel members included:

- a) Shri Vijay Gokhale, Former Foreign Secretary Government of India.
- b) Amb (Dr) Mohan Kumar, Chairman RIS, New Delhi.
- c) Air Marshal Bhushan Gokhale (Retd), Director CASS, Pune.
- d) Vice Admiral A R Karve, Former C-in-C Indian Navy.
- e) Prof Bimal Patel, DG Raksha Shakti University (RSU).
- f) Cmde Rajan Vir (Retd), Founder Indian Maritime Foundation (IMF), Pune.
- g) Cmde Sudhir Singh, Director (D&ISA), Ministry of External Affairs, GoI.
- h) Dr(Cdr) Arnab Das, Founder & Director MRC, Pune.

A report has been prepared to summarize the deliberations during the webinar and to give a broad way forward for actionable inputs for the various agencies and organizations both in the government and private sector. The detailed concept note has been attached. The substantive comments made by the esteemed panel members has also been summarized as part of this document.

The video recordings of the two-hour high level dialogue is available at <https://www.youtube.com/watch?v=yn7uhMIBUkw>

Dr(Cdr) Arnab Das
Founder & Director,
Maritime Research Centre

Air Marshal Bhushan Gokhale (Retd)
Director,
Centre for Advanced Strategic Studies



Report on Outcomes of the High Level Dialogue:



Underwater Domain Awareness (UDA) Framework for Effective Realization of the Security And Growth for All in the Region (SAGAR) Vision

A webinar on the topic “UDA for SAGAR” was held on the 26 Aug 2020 at 1600 hrs online, organized by the Maritime Research Centre (MRC), Pune in collaboration with the Centre for Advanced Strategic Studies (CASS). The webinar was structured to discuss multiple dimensions of the issue involving very senior functionaries from the stakeholders, academia, think tanks, policy makers and associated entities. The detailed concept note for the event and the list of panel members have been attached along with a brief on the substantive points made by the esteemed speakers.

The Maritime Research Centre (MRC), Pune was established as a Technology Based Think Tank to contribute towards the national requirement of Underwater Domain Awareness (UDA) in the vast Exclusive Economic Zone (EEZ) in the Indian Ocean Region (IOR) extending over 23 lakh square kilometres and is committed towards addressing issues of Strategy, Technology & Innovation and Human Resource Development. The MRC is working towards ensuring *Safe, Secure and Sustainable Growth* for India in the IOR.

The Centre for Advanced Strategic Studies (CASS), Pune having been established in 1992 as one of the first ‘Think Tanks’ in Pune. CASS has been organising various lectures, seminars (now a days Webinars) on issues of national security and nation building.

There is critical requirement to bring together the stakeholders of UDA framework, namely the National Security Apparatus, Blue Economic Entities, Environmental Regulators & Disaster Management Authorities and the Science & Technology Providers in the country and the region to ***Pool in Resources and Synergise their Efforts*** to meaningfully contribute and collectively overcome the challenges towards ensuring effective Security And Growth for All in the Region (SAGAR) as envisioned by the Honourable Prime Minister. The UDA framework can potentially provide a structured way ahead to realize the SAGAR vision. A detailed version of the UDA framework as proposed by MRC, Pune is attached at the end of this document.

The vast Undersea Area in the EEZ and also multiple Freshwater systems across the country have significant potential to contribute towards the Gross Domestic Product (GDP), however they do present significant vulnerability in terms of security concerns and other environmental issues. There is an urgent need to reach out and make the policy makers and practitioners aware of the nuances of the UDA framework to achieve the SAGAR vision. A structured initiative to involve the stakeholders is called for to mitigate the conventional fragmented approach.

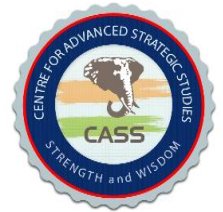
The Government of India has initiated multiple projects to enhance our Maritime Capacity and Capability in the IOR, however there are sustainability concerns and given the political volatility in the IOR, there are serious concerns related to security of these assets. Isolated efforts by the stakeholders particularly in the backdrop of the tropical littoral challenges pertaining to underwater technologies presents a very unique situation that requires massive site specific indigenous efforts. Diplomatically, India needs to take a lead in the IOR with technological and strategic superiority to contain the involvement of extra-regional powers in collusion with our adversaries in the IOR.

India was a major Maritime Power with a rich Maritime Heritage in the pre-Modern Era (before the 1500 AD). However, post-Independence we developed significant sea blindness and pursued a continental approach in all matters of decision making. A strategic maritime vision has remained a casualty and at this critical juncture the absence of Comprehensive National Maritime Strategy can cost us dearly. There is significant merit in considering a nodal agency to effectively address the challenges.

The UDA framework proposed by the MRC has significant merit in ensuring effective realization of the SAGAR vision of the Honourable Prime Minister. The deliberations through the webinar recognized the relevance of the UDA framework for realizing the SAGAR vision. The specific way forward collectively envisioned by the distinguished speakers and the participants are as follows:

1. Institutionalization of the UDA framework at the national and regional level. India needs to take the lead in the Indian Ocean Region (IOR) and develop technological superiority and propose mature regulatory provisions considering the socio-economic situation of the region to leverage diplomatically. The true realization of the SAGAR vision is possible with the effective implementation of the UDA framework. UDA framework could be considered as an agenda point in the IORA and BIMSTEK.
2. The ongoing Maritime Domain Awareness (MDA) being pursued needs to be strengthened with effective UDA to comprehensively manage the emerging geopolitical and strategic developments in the IOR and the Indo-Pacific Strategic Framework. UDA framework could be considered as an agenda point in the Indian Ocean naval Symposium (IONS).
3. Consideration of setting up a study group that will address all aspects of Policy, technology & Innovation and Human Resource Development. The panel members are well placed to constitute this study group to submit a detailed report for consideration by the Government of India.
4. Initiation of multiple multi-disciplinary UDA fellowships to address the Human Resource Generation for such a massive domain. It will also provide High End career opportunities for the young India and contribute significantly towards upskilling. The fellowships will be associated with projects and they all will contribute towards real world problem solving.

There is significant merit in taking forward the above way ahead and the Maritime Research Centre (MRC) is well equipped to play a leading role in progressing the UDA framework for effective realization of the SAGAR vision by the Honourable Prime Minister. MRC will be keen to engage with the key ministries and authorities to take forward the strategic vision. The MRC website (<http://www.foundationforuda.in/mrc/>) has more details on the projects being undertaken by them along with the engagements undertaken in the last three years since its inception.



Substantive Comments made by the Esteemed Speakers

Air Marshal Bhushan Gokhale (Retd), PVSM, AVSM, VM
Former Vice Chief of Indian Air Force
Director, Centre for Advance Strategic Studies (CASS), Pune

Air Marshal Gokhale, while delivering the welcome address, articulated the role of CASS in promoting multiple aspects pertaining to national security and nation building. He appreciated the role of MRC in promoting the niche concept of UDA framework and acknowledged their relentless efforts in taking forward this unique idea. The SAGAR vision of the Honourable Prime Minister will certainly bring back our lost maritime glory and significant efforts are required to make sure we all come together and contribute. CASS and MRC have come together for this important cause and this high-level dialogue on “UDA Framework for Effective Realization of the SAGAR Vision” will provide a comprehensive way forward. He welcomed all the esteemed speakers and reiterated that there could have been no better panel to deliberate on this important and most urgent topic in the ongoing geopolitical and strategic context. Air Marshal Gokhale also acknowledged the presence of very senior strategists and domain experts in the audience.



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

(Cdr) Arnab Das, delivered the introductory remarks and presented the UDA framework as proposed by the MRC. He articulated the four stakeholders of the UDA framework and their specific challenges and opportunities. The stakeholders include - maritime security apparatus, blue economic entities, environmental regulators and disaster management authorities, and science and technology providers. He brought out the unique political, socio-economic, and technological challenges of the Indian Ocean Region (IOR) and discussed how UDA framework can provide a comprehensive way forward. He reiterated the security and growth aspects articulated in the SAGAR vision and how India's leadership role is envisaged in the stated objective. He stated that a substantial potential of the UDA framework could consolidate nations within our maritime neighbourhood and could possibly keep the extra-regional powers at bay and ensure regional peace and prosperity. He strongly recommended institutionalization of the UDA framework at the national and regional level and stated that it should be progressed as a diplomatic tool for engaging with the IORA and BIMSTEC partners. He explained the 'Indo' part of the Indo-Pacific Strategic construct and how UDA framework could be an effective tool for India to be a strong partner in such strategic partnerships. The ongoing Maritime Domain Awareness (MDA) was discussed for its limitation in being a security-driven and only-surface concept and how the UDA framework, as proposed by MRC, encourages pooling of resources and synergizing of efforts across the stakeholders to effectively manage the challenges and opportunities in the IOR.



Amb (Dr.) Mohan Kumar
Chairman,
Research and Information System for Developing Countries (RIS)

Amb Mohan Kumar started the inaugural address by quoting a question raised in one of the recent NITI Aayog meetings - "What is the Universal Value of the Blue Economy for India?" He mentioned that it is yet to be ascertained given our limited understanding and recognition of the undersea assets. He flagged the possibility of a multilateral agreement for containing the Illegal, Unreported and Unregulated (IUU) fishing by June 2021 at the WTO. The specific concerns on this is that WTO does not recognize India as a developing country and that could adversely impact the fuel subsidies being provided to our fishermen. He specifically mentioned that forums such as IORA, IOC, IONS and others are meant for HADR and disaster relief, not for security. There are concerns on keeping the Sea Lanes of Communications (SLOCs) open given the security volatility in the IOR. India needs credible alliances with countries like US, Japan and France given their undersea capabilities and strategic presence in the IOR. He mentioned the "Five Eyes" multilateral agreement between US, UK, Canada, New Zealand, and Australia for intelligence sharing and called for a similar arrangement for the IOR in the underwater domain with India being a partner. He recognized the rise of China particularly its maritime capabilities and also its presence in the IOR. The Chinese underwater capabilities and more specifically the unmanned AI-enabled submarines for data gathering are a matter of serious concern. He mentioned that the recent rise of China needs to be recognized and countered effectively. The Chinese demonstrated their substantial presence (in the name of anti-piracy operations) in the IOR in 2008 but we did not take cognizance then and the ongoing aggressive Chinese posturing is for all to see. He strongly stated that the SAGAR vision has to be intrinsically related to the UDA framework.



Vice Admiral A K Karve (Retd), PVSM AVSM
Former Commander-in-Chief
Indian Navy

Vice Admiral Karve spoke on defining UDA in the new global order and emphatically stressed on the importance of the UDA framework in the changing dynamics of international relations. He reminded the audience of the importance of a strategic submarine as a major deterrent against nuclear capabilities and also as a credible second strike capability. He clearly laid the foundation for UDA being a strategic capability for any major power that aspires to ensure balance of power in the new world order. He enumerated the details of the Anti-Submarine Warfare (ASW) capabilities that were developed by the two super powers during the Cold War period for effective UDA. He highlighted the sustained collaborative efforts by the western and eastern blocks to develop UDA capabilities. Post the Cold War era, he recognized the dilution of the UDA capabilities and also the highly resource-intensive UDA for nations to sustain over an extended period. The rise of China and particularly its strategic submarine fleet has once again renewed global interest in UDA and the Chinese have also commenced a massive UDA capacity and capability building program. India needs to build its own UDA capabilities to be able to manage the growing Chinese strategic presence in the IOR. He very categorically mentioned that ongoing Maritime Domain Awareness (MDA) effort in India is limited in its underwater component and serious and urgent efforts are required towards UDA.



Prof (Dr.) Bimal N Patel

Director General, Raksha Shakti University

Member of the National Security Advisory Board

Prof Patel, while delivering his address on the role of academia started by noting two critical events in recent times. The first being that India laid 2300 km undersea optical fibre cable connecting Chennai and Port Blair on 10 Aug 2020. The second is that in early Jan 2020, it was announced that Reliance Communication will build 68,000 km of submarine cable infrastructure for global connectivity. He emphasized that UDA framework has the potential to transform India's destiny in terms of security and economic growth. Growing underwater threats like undersea explosives and unmanned underwater vehicles for the purpose of maritime terrorism and piracy can be extremely worrying. He brought out that under the UNCLOS, underwater data gathering is permitted for scientific and research purposes, however one cannot always ensure that such data will not be used for security applications. The emerging threats from underwater intruders to harbours, coastal assets and ships is a serious issue and merits attention. He called upon the scientific community and the academia to work on the acoustic capacity and capability building to facilitate effective deployment of AUVs/submarines and other underwater systems for military and non-military purposes. He recognized the challenges of the underwater acoustic environment and encouraged high end technology deployment including data science and underwater robotics. The legal aspect also found repeated mention in his address and an emphasis on a comprehensive legal framework to be able to address the concerns of all the stakeholders effectively. He made specific mention of the Acoustic Habitat Degradation aspects due to the growing underwater activities for security and blue economic purposes. He very strongly argued for considering the legal, regulatory, political and economic aspects of the UDA framework beyond the conventional security framework.



Cmde Sudhir Singh

Director (Military Affairs),

Disarmament & International Security Affairs, MEA

Cmde Singh, in his keynote address started by articulating the basic tenets of the SAGAR vision declared by the Honourable Prime Minister in March 2015 and also in November 2018, during the East Asia Summit and the Indo-Pacific Oceans Initiative (IPOI). He categorically mentioned that post the 26/11 incident, the Maritime Domain Awareness (MDA) initiative in the country was significantly enhanced with the setting up of the Information Management and Analysis Centre (IMAC) at Gurugram and the Information Fusion Centre-Indian Ocean Region (IFC-IOR). However, the underwater domain with its complexity and resource requirement is far more challenging to deal with. In 2019, the Spanish authorities captured a 65 ft long, single screw narco-submarine in the eastern Atlantic; this defines the nature of underwater threats we are faced with. On the other hand there are substantial opportunities in the undersea domain to be harnessed for human good. Sustainable growth for all requires serious consideration at all levels. He called for greater synergy among scientists, academia and policy makers for achieving enhanced UDA in the IOR. The SAGAR and IPOI need to be directly linked to the UDA framework and non-governmental entities can play a bigger role by associating with government authorities to draft effective policies.



Shri Vijay Gokhale
Former Foreign Secretary,
Government of India
[Moderator of the Webinar]

Shri Vijay Gokhale, as the moderator of the webinar, started his speech by endorsing that the 21st century will see most of the security and economic activities in the Indo-Pacific and more specifically in the IOR. The SAGAR vision he reiterated is largely related to the UDA and has massive security and economic implications for India as a nation. The MDA in its ongoing form has been limited due to its security driven formulation and thus, UDA should be a broader framework involving multiple ministries related to the economy, science & technology and more. We as a nation need to invest substantially towards the development of our UDA capabilities and use them for building bridges across the region. The investments need not be from the government alone; even private entities can be involved with appropriate safeguards for national security concerns. He highlighted Chinese efforts in developing far deeper UDA in the IOR with seabed mapping expeditions in terms of the number of expeditions and more importantly, with a comparative analysis vis-à-vis other nations, and the reality was shocking. He also highlighted that such surveys are not for mere scientific purposes and thus India needs to worry. The anxiety of the extra-regional powers due to lack of understanding of the tropical littoral underwater characteristics in the IOR will only lead to more such expeditions going forward and could lead to strategic confrontations. The aspect of right of innocent passage for underwater unmanned vehicles is an issue that requires clarity under the established laws of the seas. UDA is too complex compared to MDA, and we should not shy away from seeking collaboration from our partners globally. He proposed User-Academia-Industry partnership towards a sustainable UDA framework backed by a mechanisms for capacity and capability building involving large scale student participation with respectable career opportunities.



Cmde Rajan Vir (Retd)
President Emeritus,
Indian Maritime Foundation (IMF), Pune

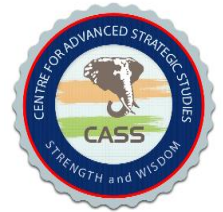
Cmde Vir delivered the vote of thanks. He noted the high-quality deliberations that took place during the course of the webinar. Being part of the entire evolution of the maritime domain since Independence, he was probably the most appropriate person to have the last word. He once again acknowledged the fact that each and every speaker represented a very unique aspect of the UDA framework and the points raised by them will go far in generating a cogent way forward towards an effective maritime vision for the country and the region. Cmde Vir appreciated MRC's effort in relentlessly pursuing the UDA Framework and acknowledged the role of CASS in partnering with MRC in this unique event. He commended the untiring and critical role of Dr. (Cdr) Arnab Das in taking forward this very important UDA framework.



As part of the Q&A session, three eminent members of the audience made very insightful remarks on the deliberations during the webinar. ***Vice Admiral K N Sushil, Dr. Erach Bharucha and Prof Roger Liu***, representing maritime security, environment and geopolitics came forward and acknowledged the importance of the UDA framework and also gave recommendations for the possible way ahead.



Event Coverage by News Agency



India's policy on IOR needs an underwater vision

By : Kunal Chonkar | September 1, 2020 | News 21

Link to article : <https://thenews21.com/pm-narendra-modis-indian-ocean-policy-sagar-needs-an-underwater-vision>



Former Naval commanders, diplomats, maritime experts, and policymakers advocate the effectuation of the Underwater Domain Awareness (UDA) for the PM Modi's SAGAR vision

@Kunal_Chonkar

New Delhi: A few weeks back China carved a door into India's backyard – Indian Ocean Region (IOR) – as it successfully secured an approval to develop a deep-sea port in Myanmar's Rakhine province. With consolidated strategic holds in both Sri Lankan and Maldivian ports, reports are now also surfacing on Beijing aiding Bangladesh to construct a state-of-the-art naval base in the Cox Bazar region. The aggressive ruddering of the PLA into the IOR since 2008, in attempts to stalemate India in its own waters present an overriding and abiding ultimatum for the realization of New Delhi's Indian Ocean policy under the Prime Minister Narendra Modi acronym – SAGAR (Security and Growth for all in the Region).

With India required to tie different, new approach strands into a coherent strategy to consolidate its leadership role in the IOR – former Naval commanders, diplomats, maritime experts, and policymakers speaking at a webinar organized by the Maritime Research Centre (MRC) and Centre for Advanced Strategic Studies (CASS), advocated the effectuation of the Underwater Domain Awareness (UDA) for the successful implementation of the SAGAR vision.

In his opening remark, Founder and Director of MRC, Dr (Cdr) Arnab Das said that armed with cold war-era technology India cannot fortify its footprint in the IOR. While raising questions on India being able to identify its role in the Indo-Pacific strategy, Dr. Das also expressed concerns about whether New Delhi has the capacity and capability building in playing the required role.

"India's military maritime strategy has remained a security-driven initiative. There has not been much participation from other stakeholders. The Maritime Domain Awareness (MDA) became an important component in India, post the 26/11 terror attacks, however not much progress been made there as well. India needs to have a comprehensive approach to its maritime security strategy involving other stakeholders," Dr. Das said.

Highlighting the 60 to 70 percent degradation of sonar performance in the IOR waters, requiring the deployment of additional assets, the former naval commander claimed that an increase in the UDA will not only double the performance but also reduce asset deployment by half. "Having denied this (UDA) to our adversary, India can easily raise its strategic advantage by four times. New Delhi must increase the UDA application to gain a strategic advantage over our adversaries," Dr. Das said, suggesting a four-point plan to realize the UDA in the SAGAR vision.

According to Dr. Das – the government must appoint a senior study group of experts to examine the 'Indo' part of the Indo-Pacific, underwater dimensions and the SAGAR vision need to be linked, New Delhi could use the UDA framework as an agenda and a diplomatic tool at marine forums like the Indian Ocean Rim Association (IORA) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

Echoing with the suggestions made by Dr. Das, former Ambassador and the Chairman of Research and Information System for Developing Countries, Dr. Mohan Kumar said that India is yet to exploit all its resources when it came to the MDA. Citing a dearth of economic research in the UDA, Dr. Kumar presented the case of India failing to develop a program to extract the polymetallic nodules present underwater. "Metals like Magnesium, Cobalt, and even rare earth can be easily recovered from our own waters (EEZ). However, not much has been done to map these resources," Dr. Kumar said. He also criticized New Delhi for expecting regional forums like IORA, Indian Ocean Commission, Indian Ocean Naval Symposium to defend the maritime security, or to maintain sea lanes of communication.

While pointing out that India does not have the stand-alone potential to check and counter the dragon's swim in the IOR, Dr. Kumar in an out-of-box suggestion – pitched for the inclusion of France in the Quad strategy. He suggested the formation of a Quad – plus France forum titled as 'Five Whales approach' to start the collection and sharing of underwater information and intelligence.

"The PLA is ever increasing its presence and strength in the IOR. Thus, SAGAR must be an intrinsically underwater domain. The SAGAR vision without UDA is senseless," Dr. Kumar outlined, while also adding that New Delhi should file pre-emptive applications towards International seabed authority to explore underwater high seas in the IOR.

Drawing a picture from the post-cold war era, veteran vice-admiral AR Karve briefed on the rapid rise and expansion of the PLA Navy. He emphasized on Beijing's renewed interest in the UDA through its development and deployment of a strategic submarine fleet in the littoral waters of the subcontinent.

"In order to check its (China) growing influence in the IOR, India must re-tool its foreign policy. New Delhi must understand that managing this area of Chinese influence is not simply a function of telling others what to do, but spend resources that deny space to China," Karve said while proposing the design of the SAGAR vision projects in the IOR rim nations to deny Chinese advances in the tropical waters.

While admitting that the UDA is a chink in India's maritime defense armor, Karve propounded South Block to procure and secure advanced technologies, not available indigenously, through strategic cooperation and collaboration with friendly nations. "India's MDA for the surface is robust but the below-water domain is not monitored. The UDA is a must for national security and the next logical step that must be pursued to complete the missing piece in the MDA. The concept and acceptance of UDA as a necessity must be approved by NSA as a national strategic project," Karve voiced.

In his pre-recorded talk presented at the webinar, Member of the National Security Advisory Group, Dr. Bimal Patel underscored the role of academia and industries in the UDA. Speaking on the security aspect of the UDA, Dr. Patel marked the need to study submerged explosive devices (sea-mines) and the collection of topical knowledge on UAVs and Unmanned Underwater Combat Vehicles.

“The UDA is important in detecting and tracking underwater intruders in harbors to provide an element of protection for ships, sensitive installations, and military bases. Increasing the operations state of AUVs is necessary to fully explore their potentials. In absence of clear rules and ideal perception capabilities one way to prevent a collision is to use acoustic communications,” Dr. Patel said.

He added that the technological impact of the new combat system adapted to the submarine environment, mobile equipped with active sensors in the field of AUVs has changed the status quo of underwater combat. Creating major vulnerabilities on the infallibility of the secret actions of a submarine.

In his quick talk at the session, maritime polymath and former vice admiral KN Sushil said that the country is not structurally equipped to deal with technology. “India keeps defining what it requires as a piece-meal system. We lack an ongoing/constant process,” Sushil said while suggesting a clearly-defined academia-navy-industrial setup and a strong business model to promote the UDA in the country.

Taiwanese professor Dr. Roger Liu in the closing minutes of the two-hour-long session upheld that India must be bolder in expanding its influence in the East Asia region in the face of geopolitical challenges thrown by China. “Many things India and Taiwan can do together in the south China sea. Both nations can conduct research in hydrology, fisheries, on the lines similar to what Sri Lanka and China have been doing in the IOR. India could do the same in those waters with nations like Taiwan, not in a way which would stimulate China harshly,” Dr. Roger said. He concluded by saying, being bold will earn in India not only in foreign policy but will also increase scope in natural sciences as well.



Underwater Domain Awareness (UDA) Framework



NirDhwani
Technology Pvt Ltd

The concept of Underwater Domain Awareness (UDA) in a more specific sense will translate to our eagerness to know what is happening in the undersea realm of our maritime areas. This keenness for undersea awareness from the security perspective, means defending our Sea Lines of Communication (SLOC), coastal waters and varied maritime assets against the proliferation of submarines and mine capabilities intended to limit the access to the seas and littoral waters. However, just the military requirement may not be the only motivation to generate undersea domain awareness. The earth's undersea geophysical activities have a lot of relevance to the wellbeing of the human kind and monitoring of such activities could provide vital clues to minimize the impact of devastating natural calamities. The commercial activities in the undersea realm need precise inputs on the availability of resources to be able to effectively and efficiently explore and exploit them for economic gains. The regulators on the other hand need to know the pattern of exploitation to manage a sustainable plan. With so much of activities, commercial and military, there is significant impact on the environment. Any conservation initiative needs to precisely estimate the habitat degradation and species vulnerability caused by these activities and assess the ecosystem status. The scientific and the research community need to engage and continuously update our knowledge and access of the multiple aspects of the undersea domain. Fig. 1, presents a comprehensive perspective of the UDA. The underlying requirement for all the stakeholders is to know the developments in the undersea domain, make sense out of these developments and then respond effectively and efficiently to them before they take shape of an event.

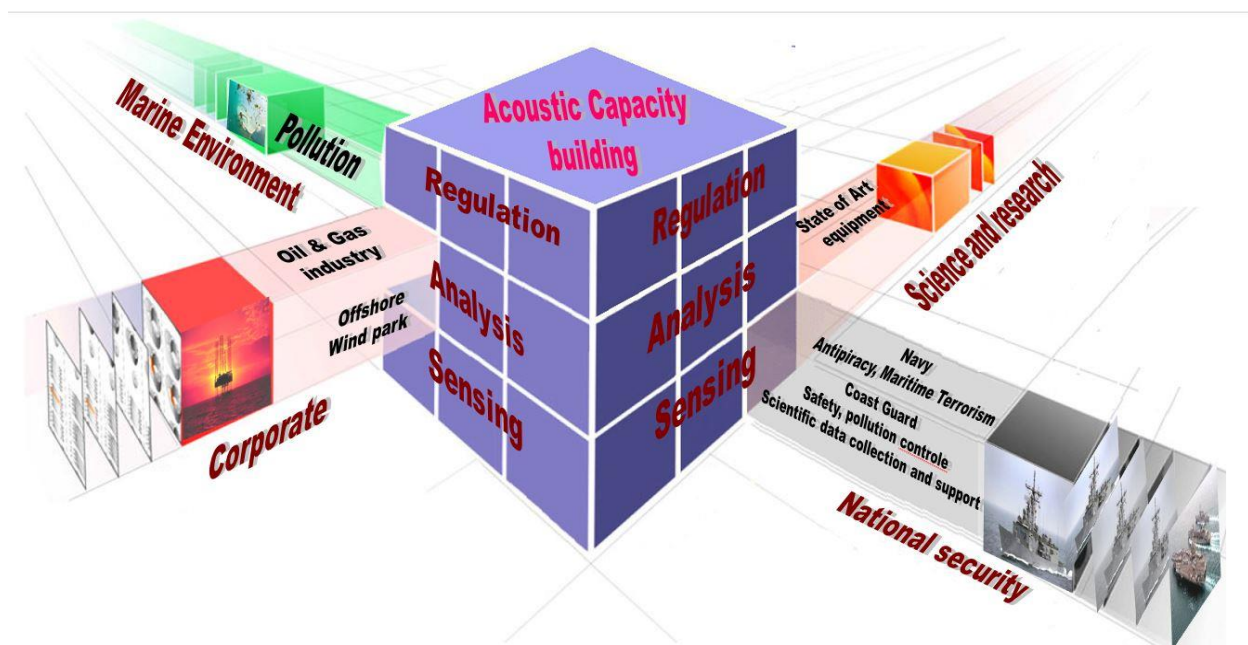


Fig. 1 Comprehensive Perspective of Undersea Domain Awareness

The UDA on a comprehensive scale needs to be understood in its horizontal and vertical construct. The horizontal construct would be the resource availability in terms of technology, infrastructure, capability and capacity specific to the stakeholders or otherwise. The stakeholders represented by the four faces of the cube will have their specific requirements, however the core will remain the acoustic capacity and capability. The vertical construct is the hierarchy of establishing a

comprehensive UDA. The first level or the ground level would be the sensing of the undersea domain for threats, resources and activities. The second level would be making sense of the data generated to plan security strategies, conservation plans and resource utilization plans. The next level would be to formulate and monitor regulatory framework at the local, national and global level.

The figure above gives a comprehensive way forward for the stakeholders to engage and interact. The individual cubes represent specific aspects that need to be addressed. The User-Academia-Industry partnership can be seamlessly formulated based on the user requirement, academic inputs and the industry interface represented by the specific cube. It will enable more focused approach and well defined interactive framework. Given the appropriate impetus, the UDA framework can address multiple challenges being faced by the nation today. Meaningful engagement of Young India for Nation Building, probably is the most critical aspect that deserves attention. Multi-disciplinary and multi-functional entities can interact and contribute to seamlessly synergize their efforts towards a larger goal.

The UDA Framework as proposed above has been formulated jointly by the Maritime Research Centre (MRC), Pune and M/S NirDhwani Technology Pvt Ltd (NDT). The focus is on all the three aspects namely Policy, Technology & Innovation and Human Resource Development. More details are available in the Wikipedia page https://en.wikipedia.org/wiki/Underwater_domain_awareness



Concept Paper



UDA Framework for Effective Realization of the SAGAR Vision High Level Dialogue – 26 Aug 2020

The Indo-Pacific strategic construct has gained substantial relevance in the recent times, due to the rise of China and India in the global matrix of geopolitical and geo-economic power play. The entire Indo-Pacific strategic space plays out, largely in the tropical littoral waters of the Indian Ocean and the South China Sea. Tropical littoral waters have a unique bearing on the naval deployments and more importantly on any underwater system deployments even for non-military applications. Socio-economically and geopolitically, as well the region has very unique characteristics that compel us to look at the strategic vision formulation in a new perspective.

The Maritime Domain Awareness (MDA) concept got substantial prominence post the 9/11 incident and the entire global community got together to build infrastructure and capabilities to address their limitations in the MDA requirement. Multiple dimensions of the MDA were given priority and the security apparatus and the research community got together to enhance their MDA capabilities. In the Indian Ocean Region (IOR), post the 26/11 incident the Indian establishment started working overtime to ensure respectable levels of MDA and the Indian Navy embarked on an ambitious plan to develop infrastructure and capabilities. It be said that in both the cases, 9/11 and 26/11 the MDA capacity building remained a security driven formulations and now the MDA is synonymous to the security measure and has no penetration with the other stakeholders. The security bogey in the IOR has ensured large spending on military hardware, in-spice of enormous socio-economic challenges. Such asymmetry in policy has ensure continued under-development in the region and most of the countries falling under the evil designs of the extra-regional powers to easily meddle into their internal politics and decision making. Environment and blue economy could be a good start for collaboration.

The fragmented geopolitics of the IOR is a major concern even for nations in the region to come together and build partnerships to overcome the local challenges. Science and technology will always be the driver for any such initiatives and joint R&D efforts are required to map these challenges. Regional policy making without such efforts to understand the unique site specific conditions is superfluous. The import of underwater hardware (both for military and non-military applications) in the absence of local indigenous efforts to develop software that can ensure optimization to the site specific conditions has resulted in poor performance and inefficient deployment of these systems. The tropical littoral waters in the region ensure performance degradation of the order of 70%, resulting in asset deployment in excess of five times or more, for the same requirement, compared to any other region.

India does have a role to play in overcoming these challenges and facilitate safe, secure, sustainable growth for all in the region. The only way forward is superior science and technology that India can provide in the region to keep the extra-regional powers at bay. India should involve in capacity and capability building for self and other nations in the region. Joint R&D initiative with field experimental validations need to be initiated at a regional level under the regional forums like IORA, BIMSTEK and others. India will be able to realise the SAGAR vision in its true sense if, we can take the UDA framework to a reasonable level. UDA framework as proposed by MRC encourages pooling of resources and synergizing of efforts.

Acoustic Capacity and Capability Building

The UDA framework as pursued by MRC is not the mere underwater counterpart of the much talked about MDA framework. The UDA framework is more about encouraging safe, secure, sustainable growth for all in the region. It is a science and technology driven formulation, where we attempt to overcome the local site specific challenges and with clear understanding of the local conditions propose policy formulations. Safe means safety from natural disaster, secure is security from man made threats and the sustainable translates to all forms of sustainability not just limited to the ecological aspects. It thus encourages comprehensive and balanced, long term growth for all in the region.

The tropical littoral water in the IOR present massive technological challenges for the UDA framework and thus acoustic capacity and capability becomes the key. Acoustic signals are the only signal that propagate underwater so understanding acoustic behaviour is the critical aspect for any optimization effort. The super powers have spent enormous efforts and resources during the Cold War period to improve sonar performance and underwater system deployments. However, their requirements were only in the deep waters in the temperate and polar regions. The IOR with the tropical littoral waters has very different conditions, thus import of the same technologies has not helped. Indigenous efforts are required.

The UDA framework has four distinct stakeholders, namely the security apparatus, blue economic entities, environment regulators & the disaster management authorities and the science & technology providers. The security apparatus will always have concerns of classified information leakage while negotiating collaborations and joint efforts, however the other three stakeholders can be benign for such collaborations. Even seeking science and technology support from the extra-regional powers for environment & disaster management can be a good option. India with its geopolitical stature and so called demographic dividend is well placed to play a leadership role in the IOR and beyond. Human resource development and specific technology & innovation projects can bind the nations in the region for a constructive initiative.

The IOR is blessed with massive undersea resources and at the same time we are also vulnerable to environmental degradation and disasters originating from the seas. The active non-state actors further enhance the vulnerabilities that cannot be handled with conventional means. Effective UDA framework is the only way forward where, we not only develop capabilities for self, but also use it as a diplomatic tool to bring our neighbours together. A calibrated way forward with awareness in the short term through seminars, workshops and interactions. The mid-term could be academic programmes and certain marine conservation & disaster management projects on specific aspects that could generate deeper understanding of the local conditions. The long term would be policy formulations at the regional level and also Post Graduate & PhD programmes at a joint level.

Proposal

It is proposed to organize a high level dialogue titled “Strategic Partnership for Research and Capacity Building on the UDA Framework”, on 26 Aug 2020. The regional cooperation is critical for peace & prosperity in the region and UDA framework is the most relevant aspect that can bind all of us together. The dialogue will bring representatives from the think tanks and decision makers together to deliberate on this issue and formulate way ahead for a collective national efforts in taking forward the UDA framework on the regional level. Organizational structure, resource allocation, coordinating agency and other issues will be discussed and formalized. The event will be organized by the Maritime Research Centre (MRC), Pune and Centre for Advanced Strategic Studies (CASS). It will be an online event and the login details will be made available in the MRC and CASS websites.

Conduct of the Programme

The broad strategic relevance of the dialogue entails that the participants get exposed to the policy issues, technological means, innovative tools and measures, geo-politics, organizational aspects both nationally and globally, regional and global frameworks, and more. The multiple organizations and their mandates within the country and their compatibility with similar entities and user entities will be discussed. The GAP analysis in terms of policy and means and measures will be discussed. A detailed dialogue resolution will be prepared and submitted to the authorities and agencies within and outside the government for further action. The MRC will continue to engage with these agencies and authorities to facilitate effective realization of the SAGAR vision through an effective UDA framework.

Detailed Programme

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| 1600 hrs- | Guest Join and informal interactions. |
| 1615 hrs- | Welcome Remarks by Air Marshal Bhushan Gokhale. |
| 1620 hrs- | Inaugural Address by Amb (Dr.) Mohan Kumar, Chairman RIS. |
| 1635 hrs- | Introductory Remarks by Dr(Cdr) Arnab Das, Founder & Director MRC. |
| 1650 hrs- | Defining UDA in the new Global Order – Vice Admiral A R Karve, Former C-in-C. |
| 1705 hrs- | Role of Academia – Prof (Dr.) Bimal N. Patel, DG RSU. |
| 1720 hrs- | Keynote Address – Cmde Sudhir Singh, Director (Military Affairs), D&ISA, MEA. |
| 1735 hrs- | Closing Remarks by Shri Vijay K Gokhale. |
| 1750 hrs- | Q&A. |
| 1805 hrs- | Vote of Thanks by Cmde Rajan Vir, Emeritus President IMF. |

Convenor

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

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Mobile: +919665033463.



"India needs to develop a comprehensive Underwater Domain Awareness Strategy."

Shri Vijay K Gokhale
Former Foreign Secretary, Govt of India

"Ocean Governance in the IOR and the SAGAR vision need to be backed by the UDA framework."



Air Marshal Bhushan Gokhale (Retd), PVSM, AVSM, VM
Former Vice Chief of Air Staff
Director, Center for Advanced Strategic Studies



"The SAGAR Vision cannot be imagined without Underwater Domain Awareness (UDA)."

Amb (Dr) Mohan Kumar
Chairman,
Research & Information Systems for Developing Nations

"The ongoing Maritime Domain Awareness (MDA) is largely limited to the surface and the underwater aspects needs to be developed effectively."



Vice Admiral A R Karve (Retd), PVSM, AVSM
Former Commander-in-Chief,
Indian Navy



"Understanding and researching the international law of the sea aspects of the UDA is essential for maritime security and stability."

Prof (Dr) Bimal N Patel
Director General, Rakshashakti University.
Member, National Security Advisory Group

"The principles enshrined in the SAGAR Vision provide with the framework to address some of challenges of security and economic revival in the IOR."



Cmde Sudhir Singh
Director (Military Affairs), D&ISA MEA



"Move ahead meaningfully to implement UDA framework in the India Ocean Region."

Cmde Rajan Vir (Retd),
President Emeritus,
Indian Maritime Foundation

"Pooling of Resources and Synergizing of Efforts are the key aspects of the UDA framework."



Dr Cdr Arnab Das
Founder & Director
Maritime Research Center, Pune