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Vietnam's Quest for Enhanced Maritime Domain Awareness

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The CSB-8021, one of the Vietnam Coast Guard's newest ships. Picture uploaded to Faecbook on 29 August 2021. Source: Facebook, VietDefence at https://www.facebook.com/VietDefenseVN.

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EXECUTIVE SUMMARY

- Maritime domain awareness (MDA) is crucial to Vietnam's defence of its territorial integrity and safety of navigation as well as its economic interests and marine environment.

- Vietnam has been enhancing its underwater, surface, and coastal domain awareness by modernising its sea, air, and space assets through both self-help efforts and external assistance.

- Vietnam also partakes of international cooperation and information sharing to improve collective MDA capabilities.

- To have adequate MDA to monitor its long coastline and vast maritime area, however, Vietnam needs to accelerate its adoption of advanced space technologies, further embrace multilateral maritime security cooperation, and invest in grassroots solutions.

INTRODUCTION

Vietnam is a maritime nation with a long coastline and a vast Exclusive Economic Zone (EEZ).[1] As such, maritime domain awareness (MDA) is essential for the country to protect its maritime security. Since setting the goal in 2006 of turning itself into a strong regional marine economy,[2] the country has improved its MDA through both self-help efforts and external assistance. This article discusses Vietnam's perspective on maritime security and MDA; its modernisation of sea, air and space assets to enhance MDA; and the additional steps the country can take to boost its MDA.

MARITIME SECURITY AND MARITIME DOMAIN AWARENESS

Vietnamese authorities have yet to provide an official definition of "maritime security".[3] However, an article on the Vietnam Border Guard's website defines the concept as "a state of stability, safety, and freedom from sea-based or land-based threats that may impede the normal activities of countries, organisations, and individuals at sea, or sea-based threats to the normal activities of countries, organisations, and individuals on land."[4] This definition implies that Vietnam's notion of maritime security is comprehensive in nature, taking into account both traditional and non-traditional aspects.

Vietnam places tremendous importance on maritime security for several reasons. First, the country is involved in territorial disputes over the Paracel and Spratly Islands in the South China Sea. Protecting its sovereignty and asserting its sovereign rights over these contested areas are the top priorities in Vietnam's maritime strategy. Second, Vietnam's export-oriented economy relies on the safety and freedom of navigation in its waters and the wider maritime region. Third, Vietnam depends on maritime resources for many economic activities, such as fishing, aquaculture, and offshore oil and gas exploration. Safeguarding these interests is therefore essential to Vietnam's economic wellbeing. Lastly, protecting marine biodiversity and coastal habitats is crucial for Vietnam's sustainable development.

As with the concept of "maritime security", the concept of MDA has not been officially defined by Vietnamese authorities either. However, existing definitions are applicable. According to the International Maritime Organization, MDA is "the effective understanding of anything associated with the maritime domain that could impact security, safety, the economy or the marine environment."[5] Meanwhile, Transport Canada offers an expansive definition of MDA, which encompasses accurate and up-to-date information about "everything on, under, related to, adjacent to, or bordering a sea, ocean or other navigable waterway," including any and all activities, structures, individuals, goods, vessels, and transportation methods.[6] It means MDA entails underwater, surface, and coastal domain awareness.

Thus, MDA serves as the "engine room" for maritime security governance at both national and international levels.[7] With a comprehensive awareness of the maritime domain, coastal states like Vietnam can better detect, deter, and respond to maritime security threats. Furthermore, with robust MDA, coastal states can understand maritime patterns, anticipate maritime security threats, and deal with them in an effective manner before they escalate. For example, knowing where threats are most likely to occur or where illegal activities often take place allows for more efficient deployment of patrol vessels, aircraft, and personnel.

At the national level, the main actors in Vietnam's MDA are the Vietnam People's Navy (VPN), the Vietnam Coast Guard (VCG), and the Vietnam Fisheries Resource Surveillance (VFRS).

The VPN is the core force in defending Vietnam's sovereignty, sovereign rights, and territorial integrity in its seas and islands. It also participates in natural disaster prevention and control, search and rescue, and protects marine economic activities in accordance with Vietnamese and international laws.[8] The VPN contributes to Vietnam's MDA by deploying its naval assets, including ships, submarines and aircraft, for surveillance and reconnaissance missions over vast and critical maritime areas.

The VCG is a part of the People's Armed Forces and serves as the state's maritime law enforcement agency. It is responsible for protecting Vietnam's sovereignty, sovereign rights, and national jurisdiction in its maritime regions; ensuring maritime security and order; and upholding both Vietnamese laws and international treaties to which Vietnam is a party. The VCG is equipped with ships, aircraft, weapons, explosives, support tools, and technical equipment to perform its functions, tasks, and powers.[9] By maintaining a consistent presence at sea, the VCG can detect, monitor, and address activities that may threaten Vietnam's maritime interests.

The VFRS is a state agency that enforces Vietnam's laws and international treaties related to aquatic resources. Its responsibilities include patrolling, inspecting and acting against violations; educating about fishing laws; protecting Vietnamese maritime sovereignty; and promoting international cooperation in fisheries surveillance. The VFRS has the authority to request relevant information, manage weapons and equipment for surveillance purposes, and chase or arrest non-compliant individuals or vessels.[10] An important aspect of the VFRS relates to its ensuring the legal implementation of aquatic exploitation and protection, including preventing illegal, unreported, and unregulated (IUU) fishing.

Depending on specific issues, collaboration and coordination among VPN, VCG and VFRS might be handled through inter-agency mechanisms. For instance, the VFRS has closely coordinated with the VPN, the VCG, and other authorities to combat IUU fishing, aiming at lifting the European Commission's "yellow card"—an official warning issued by the European Union to Vietnam for falling short in tackling IUU fishing.[11] However, there is no singular central agency solely dedicated to the coordination of all maritime activities.

VIETNAM'S EFFORTS TO IMPROVE ITS MDA

Vietnam's need to bolster its MDA stems from an array of evolving traditional and non-traditional security challenges affecting its national security and economic vitality. Chief among these is China's increasing assertiveness in the South China Sea, including the construction and militarisation of artificial islands, and frequent naval patrols, all of which reinforce China's expansive territorial and maritime claims. Vietnam also faces the persistent issue of IUU fishing, which not only threatens the economic wellbeing of local communities but also the country's international reputation. Moreover, Vietnam grapples with the complex issue of smuggling, including drug trafficking, human trafficking, and the transportation of contraband. This further complicates its security environment. In response, Vietnam has been

making an effort to enhance its underwater, surface, and coastal domain awareness, by modernising its sea, air, and space assets.

Underwater Domain Awareness

Vietnam has significantly enhanced its underwater domain awareness through the deployment of submarines. In 2009, the country placed an order for six Project 636 Kilo-class submarines from Russia, which were delivered between 2013 and 2017. These Kilo-class submarines are specifically designed for anti-submarine warfare and anti-surface-ship warfare, but are also capable of general reconnaissance and patrol missions. Regarded as one of the world's most silent diesel submarines, they possess remarkable stealth capabilities. Equipped with advanced MGK-400EM digital sonars, their capacity to detect enemy submarines exceeds their own detectability range by three to four times. They can detect targets in sonar listening mode and engage in telephone and telegraph communication in both long-range and short-range modes. Moreover, they are equipped with radar that operates in periscope and surface modes, providing valuable information on underwater and air situations, radar identification, and navigational safety.[12]

Before acquiring the Kilo-class submarines, Vietnam had been operating two Yugo-class midget submarines obtained from North Korea.[13] The Yugo-class submarines, with their compact size, serve as cost-effective options for coastal operations and limited missions.[14] However, the Kilo-class submarines offer superior range, endurance, and versatility. Their larger size, advanced propulsion systems, and greater crew capacity enable them to undertake a wider array of missions and establish a more formidable maritime presence. This allows Vietnam to patrol its territorial waters and EEZ more effectively.

Surface Domain Awareness

Between 2011 and 2018, Vietnam made significant progress in enhancing its surface domain awareness by expanding its fleet of vessels, predominantly sourced from Russia. The VPN acquired four Project 10412 Svetlyak patrol crafts,[15] which can be deployed to various missions, including safeguarding coastal lines of communications. During this period, Vietnam also purchased four Gepard-3 frigates from Russia as part of its naval expansion. The first two frigates were ordered in 2006 and were successfully delivered in 2011, followed by two Gepard-3.9 versions which were delivered between 2017 and 2018. The Gepard 3.9 class frigates are well-equipped for convoy operations and patrols, and for safeguarding the maritime border and EEZ.[16] In addition, Vietnam constructed four FC-54 patrol crafts, known as TT400TP in Vietnamese, between 2012 and 2014 based on a design purchased from Russia. These ships were constructed at the Hong Ha Shipbuilding Plant under the supervision of the Defence Industry General Department.[17]

Vietnam has also increased the number of its vessels with the help of its foreign partners. In 2022, India handed over the 12 high-speed patrol boats built under the US$100-million line of credit extended to Vietnam in 2014.[18] In June 2023, India further announced it would provide Vietnam with an active-duty missile corvette–the first time India has ever granted a warship to another country.[19] Japan provided the VCG and VFSR with seven second-hand marine vessels

(along with maritime safety equipment) in 2015, and six new patrol boats in 2017.[20] In 2020, Tokyo loaned Hanoi US$348.2 million to build six more patrol vessels, which are expected to be delivered to the VCG by 2025.[21] The VPN received two Pohang-class corvettes from South Korea in 2017 and 2018.[22] Meanwhile, the United States delivered 24 new Metal Shark patrol boats and two used Hamilton-class cutters to the VCG between 2017 and 2020.[23] In 2022, Washington promised to transfer another cutter to Hanoi.[24]

In addition, Vietnam has utilised airborne resources to enhance its surface domain awareness. In 2010, the VPN ordered three DHC-6 (Guardian-400 version) maritime patrol aircraft from Canada, which were delivered in 2014. These are used for surveillance as well as search and rescue missions across Vietnam's coastal areas.[25] Additionally, in 2018, the VPN procured from Israel three Heron unmanned aerial vehicles (UAVs) with medium-altitude long-endurance capabilities, which were delivered in 2021. The Heron system is equipped to handle up to six diverse mission payloads simultaneously. This allows for complex intelligence, surveillance, target acquisition, and reconnaissance operations across various terrains, including at sea.[26]

Vietnam further augments its surface domain awareness using space-borne resources. In 2013, Vietnam achieved a significant milestone in its space programme with the launch of its first Earth observation satellite, VNREDSat-1, constructed by Airbus. The satellite has remained operational in orbit for ten years, double its anticipated lifespan. Throughout this extended period, VNREDSat-1 has played a vital role in tackling various challenges, including water resources management and coastal management.[27] Currently, Vietnam is exploring the development of the successor programme, VNREDSat-2; however, progress has stalled due to the pending finalisation of the procurement process, and the selection of the launching agency.[28]

In 2020, Vietnam commissioned the LOTUSat-1, a Japanese-built Earth observation satellite system funded by Official Development Assistance, from the Japan International Cooperation Agency. The system includes a satellite, a ground system, and training programmes. The satellite, equipped with Synthetic Aperture Radar, was initially slated for a 2023 launch, but the target has been shifted to 2024. The ground-based infrastructure comprises a parabolic antenna, a control hub for satellite operations, a centre for utilising mission data, and an interface for users. The LOTUSat-1 will be key in Vietnam's efforts to combat natural disasters and address climate change issues.[29]

Vietnam has made use of its partners' space assets to enhance its surface domain awareness. In 2018, Hanoi reached an agreement with New Delhi to set up the Data Reception and Tracking and Telemetry Station (DRTTS) in Ho Chi Minh City. The DRTTS allows India to track and receive data from its Earth observation satellites as they pass over Southeast Asia. In return, India provides Vietnam and its regional partners with satellite imagery, which is instrumental in monitoring China's activities in the South China Sea.[30]

Vietnam's surface domain awareness is also enhanced with SeaVision,[31] an advanced web-based maritime situational awareness tool promoted by the U.S. Navy and managed by the U.S. Department of Transportation. With its user-friendly interface, SeaVision allows users to view

and analyse maritime data based on user-defined rules, facilitating better decision-making and response coordination. In November 2019, instructors of the U.S. Naval Information Warfare Center Pacific offered a training course in Hanoi for 16 members from different maritime authorities of Vietnam on how to use SeaVision to identify different situations at sea and to protect national sovereignty. In April 2021, the U.S. Office of Defence Cooperation and the Bureau of Drug Prevention and International Law Enforcement provided a similar online training course for various Vietnamese maritime agencies including the Vietnam Maritime Administration, provincial and municipal port authorities, the Maritime Search and Rescue Coordination Center, and the Directorate of Fisheries.[32]

Coastal Domain Awareness

To enhance its coastal domain awareness, Vietnam has strategically installed radar stations along its extensive coastline, from Quang Ninh Province and Hai Phong in the North to Phu Quoc Island in Kien Giang Province in the South. One example is the domestically produced VRS-CSX medium-range maritime radar built by Viettel High Technology Corporation.[33]

Another pillar of Vietnam's coastal domain awareness is the vigilant monitoring of ports and other coastal facilities. In 2013, the Vietnamese General Department of Customs issued Regulations on Customs Supervision by Camera System, which mandated the installation of identification cameras, and CCTV operating 24/7 to monitor ports.[34] Since then, local authorities have instructed relevant agencies to install these surveillance cameras to look out for suspicious cargo and illicit activities.[35]

Additionally, Vietnam keeps a close watch on its coastal ecosystems with support from the Australian government. Notably, under Australia's Marine Resources Initiative (MRI), which was launched in 2020, the Department of Foreign Affairs and Trade, Geoscience Australia, and the Australian Institute of Marine Science (AIMS) have utilised leading-edge satellite imaging and modelling technology to assist marine spatial mapping and coral reef monitoring in Vietnam and other Southeast Asian countries.[36] Geoscience Australia has arranged two educational trips to Australia for Vietnamese officials and scientists to improve their understanding of seabed morphology, as well as data collection and processing techniques. Moreover, AIMS signed a Memorandum of Understanding with the Institute of Oceanography in Vietnam to collaborate on coral reef monitoring.[37]

ROOM FOR IMPROVEMENT

While the modernisation of sea, air, and space assets has significantly bolstered Vietnam's MDA, there is still much room for improvement.

First, there is an urgent need for the country to accelerate its space programme. Even with an increased number of vessels, Vietnam struggles to adequately cover its extensive waters, making reliance on satellites and emerging technologies inevitable. The technology of Vietnam's first earth observation satellite, VNREDSat-1, has become outdated due to technological advancements in the past decade. Moreover, with the rapid surge in data volume,

there is a pressing need for artificial intelligence integration to detect anomalies and facilitate advanced data analysis.

Second, Vietnam needs to further embrace multilateral maritime security cooperation. Vietnam has actively participated in some regional multilateral capacity-building programmes, such as the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP),[38] Australia's Maritime Consultancy 1.0 and 2.0 programs,[39] and the Southeast Asia Cooperation and Training exercise.[40] However, Vietnam has been reluctant to join the Critical Maritime Routes Indo-Pacific (CRIMARIO),[41] a maritime capacity-building initiative by the European Union. Officials from CRIMARIO have invited Vietnam to join the Indo-Pacific Regional Information Sharing (IORIS) platform, a secure web-based maritime coordination and information-sharing tool that can complement SeaVision to enhance Vietnam's MDA capabilities. CRIMARIO has also offered a series of virtual training courses to Vietnamese officials. However, Vietnam has neither joined IORIS nor clearly communicated its intentions, leaving potential collaborators uncertain about its stance.[42]

Vietnam should also consider joining the Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA), a technology and training initiative announced by the Quadrilateral Security Dialogue member states (Australia, India, Japan and the United States) in 2022. IPMDA employs cutting-edge technology, including commercial satellite radio frequency, to provide regional partners with almost real-time information on activities taking place within their respective maritime zones.[43]

Finally, while Vietnam has predominantly adopted a top-down approach in bolstering its MDA, there is untapped potential in harnessing bottom-up initiatives. A viable strategy could involve equipping mariners from coastal communities with internet-connected smartphones, which allows the utilisation of free crowdsourced mobile applications like SeaWatch to combat IUU fishing. By actively documenting illicit activities they encounter at sea, these mariners would be able to provide valuable assistance to maritime authorities.[44] Such grassroots solutions are cost-effective ways to enhance the reach and efficiency of Vietnam's maritime law enforcement.

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