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Maritime Asymmetric Warfare Strategy and the Development of Indonesia's Distinct Anti-Access and Area Denial (A2/AD) Strategy

Indra Alverdian, Mateo Aditya Yudha, Noah Mahatantya Rajadewa

Abstract:

This paper seeks to examine the prospects of developing a distinct, indigenous Indonesia's Anti-Access/Area Denial (A2/AD) strategy within its current and future defence strategic planning, centred on its maritime archipelagic geography. In particular, the paper proposes the potential benefits and efficacy of utilising low-cost assets in developing Indonesia's A2/AD capabilities. It argues that considering Indonesia's distinct approach to warfare, shaped by its historical context and unique archipelago, provides a framework for understanding deterrence within the spectrum between denial and punishment, thereby strengthening the utility of these low-cost assets. In particular, the authors argue that the validity of this approach utilizing low-cost assets exploiting Indonesia's geography as opposed to the high-tech platform-centric approach to anti-access and area denial warrants further academic discussion, in line with the development of Indonesia's Trident Shield of Nusantara (*Trisula Perisai Nusantara*) concept, which emphasises the integration and jointness of the nation's armed forces.

Keywords: *Anti-access, Area-denial, Maritime security, Asymmetric warfare, Indonesia, archipelago, Indonesia, low-cost, geography.*

INTRODUCTION

Indonesia's position in the Indo-Pacific is strategic, as it controls key maritime chokepoints vital to international maritime trade and regional security. The chokepoints of the Strait of Malacca, the Lombok Strait, and the Sunda Strait, give Indonesia not only benefits, but also challenges in terms of governance of its maritime defence security. This dual characteristics of Indonesia's geography has been previously emphasized by Kaplan in his seminal work on geography,

> *A state's territorial location is an important factor that determines its benefits and challenges relative to other states. Indonesia's geography, besides its importance in international maritime transit and trade, also presents challenges in the defence of its multi-island archipelagic territory* (Kaplan, 2013)

The following figure showing the volume of global trade passing through Indonesia's straits highlights the centrality of Indonesia's archipelago chokepoints in facilitating global trade and maritime transit (Verschuur, Luma, & Hall, 2025)



Figure 1. Map of Indonesian Chokepoints and South China Sea

Source: (Verschuur, Luma, & Hall, 2025)

In the contemporary strategic environment in Southeast Asia, the contestation of global powers and evolving geopolitical landscape in regional maritime security require the archipelagic nation to develop a sustainable and credible anti-access and area denial strategy to manage

possibility of its environment becoming an active area of militarized contestation between global and regional powers. Consequently, the current research derives from the fact that firstly, Indonesia has a need for a defence strategy that emphasizes its maritime domain capabilities; and secondly, Indonesia's defence capabilities must be tailored to face against an adversary that may have qualitative or quantitative superiority. Existing research by Evan Laksmana, suggested the necessity of greater academic and scholarly discussion and debates on the development and subsequent implementation of an indigenous Anti-Access/Area Denial (A2/AD) strategy (Evan, 2020). In this regard, A2/AD is defined as a combination of actions and or systems designed to restrict access to an area or theatre for an adversary (anti-access) and also to deny the adversary mobility in the related areas (Świętochowski & Rewak, 2021).

The current research, however, acknowledges several key issues which constraints the implementation of an A2/AD strategy in Indonesia. First, the concept of A2/AD itself is assumed to be inseparable from a platform-based or technology-based approach. This has been the case for China's or US' A2/AD strategies, which uses advanced and coordinated combat systems, including backscatter radars, satellite coverage, anti-ship missile systems, and ballistic missiles, among others that reflects A2/AD's centrality in high-tech platforms and approaches (Tangredi, 2019). The use of high-tech systems in contemporary A2/AD strategy may compound its use in small states, whereas the context of small to middle power states with large swaths of territory such as Indonesia may not be able to work with high-tech oriented systems (Habib & Shamrir Al Af, 2024). In addition, the paths towards a platform based A2/AD system which are solely centred on high technology military systems and equipment would put a tremendous strain on Indonesia's economy with military funding consisting only 1% of Indonesian GDP (Ministry of Defence of the Republic of Indonesia, 2015).

Therefore, this paper conducts a preliminary insight into the possibility of an alternative approach to A2/AD which may benefit Indonesia, substituting the path towards costly investments high-tech systems to an approach which may leverage Indonesia's distinct archipelagic territorial character. Consequently, the research aims scrutinise the potential relevance of a geography-based approach to A2/AD strategy in the Indonesian context as a possible course of action in line with Indonesia's defence strategy development. Thus, the current research proposes a research question: *how could Indonesia develop a distinct archipelago geography-based approach to its anti-access and area-denial strategy in line with its defence planning and modernization?*

This research defines three strategic rationales for geography-based A2/AD in Indonesia: development of asymmetric capabilities, geographic and geopolitical considerations, and changes in Indonesia's defence planning. The first and primary rationale for adopting a geography-driven A2/AD is the development of asymmetric capabilities. Although it would be more of a necessity than a rationale, it is known that Indonesia would have limited military capabilities and constraints in building up military technology than its counterparts in the region or major world powers. With its current capabilities, the current research argues that Indonesia cannot follow the technological

"race"—mainly due to economic considerations (e.g. budgetary constraints) (Agastia, 2017). Moreover, it would be in Indonesia's best interests to avoid triggering an arms race such as rapid procurement of armaments, which had been a prevalent issue in Southeast Asia since at least the 2010s (Bitzinger, 2010).

The second rationale is about Indonesia's geography and geopolitical position in world affairs. Indonesia's archipelago geography and terrain presents opportunities to develop an indigenous model of A2/AD due to its complex maritime terrain, comprising thousands of islands. These islands and other features, such as straits and peninsulas, offer natural barriers and chokepoints. In the current geopolitical landscape of Asia, where the United States and China are actively pursuing their interests in the region (e.g. Philippines-China dispute in the South China Sea) (Imanuddin & Sugito, 2021), it would be crucial for Indonesia to prevent the use of Indonesia's waterways as a zone of contestation by having an anti-access strategy (Evan, 2020). The research noted that Indonesia's geography is vulnerable to access, especially to submarines of foreign navies (e.g. AUKUS Members) via Indonesian waterways of ALKI II (Agoes, 2009). Moreover, transit through the ALKI II sea lane adjacent to the Ibu Kota Nusantara (IKN) in Borneo may thus pose a potential danger to the Indonesian capital (Rovan & Alverdian, 2023).

The third rationale of A2/AD in Indonesia lies in the change of strategy or defense plan of the Indonesian Armed Forces: whereas MEF (Minimum Essential Force), a strategic program had started to be phased out, implying a post-MEF ERA that is to come for the Indonesian Armed Forces (Evan, 2020). Currently, MEF will be replaced with another concept introduced in 2023, titled Trident Shield of Nusantara (*Perisai Trisula Nusantara*) which emphasizes on integration and joint warfare doctrines and force posture for the three services. Meanwhile, there is indication of MEF's progress in some areas which may be short of initial targets. For example, the latest progress, dated 2010-2019, stated that for the Army, Navy, and Air Force, respectively, the percentage of MEF completed are 74,62%, 68,72%, and 44,40% (Annisa & Djuyandi, 2021).

THE INDONESIAN CONCEPTION OF DETERRENCE AND ANTI ACCESS / AREA DENIAL.

The inter-relationship between the concept of deterrence and a nation's anti-access / area denial strategy must begin with the conceptual analysis of deterrence as a concept. Deterrence is based on the psychology of influencing the rationality of a would-be aggressor or adversary against the first use of force. According to Morgan, `deterrence involves manipulating someone's behaviour by threatening with harm`. He further argued that 'deterrence involves the threat to use force as a way of preventing the first use of force by someone else' (Morgan, 1983). This logic of dissuasion is centred on the rationality of influencing the cost-benefit calculus of potential adversaries. However, the authors of this paper argue there is a danger of 'mirror imaging', in the sense that the credibility of the deterrence on the part of the potential adversaries may not rest on the rationality of cost-benefit calculus of military power, whereas factors such as nationalism,

historical and local contexts, strategic and political cultures and distinct geographies may negate the cost-benefit rationality of the deterrence equation for some states, exemplified by US-led coalition war in Afghanistan against the Taliban (Farrell, 2018). The previous arguments suggest that the development of any anti-access area denial strategies for nations must be in line with the sets of expectations within the overall deterrence concept as part of the overall national security framework of that particular nation. There must be a clear positive relationship between grand strategy and military strategy – conceptual and practical dimensions. The Peloponnesian War between Sparta and Athens is illustrative of the fallacies of the cost-benefit rationality of deterrence (Rover, 2025).

While the general conception of deterrence has been addressed, the research would address the dominance of the platform-based A2 / AD approach in existing literature, which is attributed to the oversimplification of deterrence conditions, which generally categorise deterrence as comprising two kinds of potential deterrence situations or conditions. First, there is general deterrence in which a state or a group of states maintains a specific military posture to thwart any possible attacks (Morgan, 2019). Second, immediate deterrence, whereas a state threatened with being attacked puts its military forces on a higher level of alert (Morgan, 2019). Thus, deterrence here is defined as an action to discourage or dissuade another actor from undertaking specific actions by threats or punishment (Wilkinson, 2020). These two categorisations of deterrence situations which emphasises escalation control create a particularistic tendency where the projection of the image of military superiority is of a greater significance, supporting the dominance of the development of a platform-based A2/AD. The emphasis of general and immediate deterrence also implies the integral role of a technology-centric approach which centres on the integration of early warning system in the threat of punishment calculus. These strategic mindsets on deterrence and the utility of technological-centric approaches meant that military strategies such as preventive and pre-emptive attacks, which rely heavily on military technology due to its emphasis on speed and surprise, is a general reflection of the inclination towards a platform-based A2/AD approach.

This narrow general understanding of the concept of deterrence, which stems from the historical contexts of the Cold War US-Soviet Union nuclear détente perpetuates the position of platform-based A2/AD approach as ideal. However, several scholars of strategic studies have criticised this over-simplified understanding of the concept of deterrence. Morgan illustrates that deterrence today may involve threats of punishment beyond retaliation (Wilkinson, 2020). Meanwhile, others point to the danger of misperception of the rationality of 'strategic coercion' in the deterrence equation (Freedman, 1998). A noted military scholar illustrates this danger by referring to the neglect of doctrinal differences between the US Military and China's PLA, which may fail deterrence and escalate the conflict (Twomey, 2010). Consequently, there is a danger of the universal application of platform-centric A2/AD which may not apply to all states, noting differences in contexts, strategic cultures and timeframe. Indonesia is a reflection of this potential fallacy as would be further illustrated in this paper.

The Indonesian psychology of deterrence, however, based on the established definition, is distinct. The Indonesian model of deterrence does not fit into the criteria of 'deterrence by denial' (e.g. preventing the use of certain methods by the adversary) nor 'deterrence by punishment' (e.g. threatening the adversary with harm) (Mazarr, 2018). The Indonesian model of deterrence sits between said two spectrums, and more so views deterrence as a 'stay-in-the-game' strategy or a delaying strategy for Indonesia's diplomatic pursuit in international forums. The 1945 Battle of Surabaya as a part of the Indonesian Revolutionary War embodies this understanding of a 'delaying strategy' while at the same time rallying domestic and international support to Indonesia's plight (Kusuma, Anwar, Risman, & Arief, 2021). The battles of the Indonesian Revolutionary war put an emphasis on asymmetric warfare, whereas the deterrent factor is raising costs of intervention from stronger actors (Arreguin-Toft, 2009). Concurrently, Indonesia's defence strategy and deterrence development also comes from its military history. In contrast to other states, Indonesia has developed a concept of layered defence (*Lapis Pertahanan Militer*) divided into three "mandalas" or circle of spaces which imply centrality of the core opposed to its periphery (Ministry of Defence of the Republic of Indonesia, 2014). Based on these preferences, pure reliance on pursuing force development planning emphasizing solely on high-technology centric platform might be worthy of reconsideration, noting that war-fighting objectives and deterrence in Indonesia's understanding emphasises attrition, survival and the protection of the core islands in tandem with its diplomatic strategy, instead of simply as a war-winning military strategy.

Different measurements of winning and losing and the Limitations of High-Technology Platform-based A2/AD strategy

Another aspect which questions the universal application of a platform-based A2/AD strategy centred on technology is the fact that history has proven that nations have different measurements of winning and losing in an armed conflict. This has potential implications on the way deterrence is perceived, deterrence by denial, and deterrence by punishment through the threat of military force. J. Boone Bartholomees in his work on 'theory of victory', has noted that a victory on the battlefield may not constitute winning the overall war. Thus, the definition of winning and losing rests sometimes not simply on the facts but the subjective assessment of the situation (Bartholomees, 2008). Consequently, in terms of deterrence, the perceived efficacy of the use of military force either through denial and punishment, must be seen in the three-tiered framework; tactical, operational and strategic. This is because the power of resistance of the potential adversaries on the mechanism of deterrence may not simply lie in the strength or capabilities of its military force, but on other factors such as political ideologies and nationalism, as illustrated by the Vietnam War.

In contrast to the general preference for the platform-based A2/AD approach, we argue that an Indonesian model of A2/AD would be better suited if it follows a specific geography-driven capability approach, noting Indonesia's distinct maritime geography and historical experiences on

guerrilla warfare. This approach of A2/AD emphasises the use of geography as a building block of an indigenous Indonesian A2/AD. In particular, the next section will investigate the potential of an Indigenous asymmetric Anti-Access/Area Denial (A2/AD) strategy as a cornerstone of Indonesia's maritime defence posture that stems from our previous critiques of the platform-based A2/AD approach highlighted in this section.

THE PROPOSED ELEMENTS OF GEOGRAPHY-BASED A2/AD STRATEGY

Based on the considerations addressed by earlier discussion, this study proposes two major arguments; first, development of Indonesia's A2/AD strategy should emphasize on its unique archipelagic geography, rather than simply imitating the general trend towards a high-technology dependent platform-based approach. Second, future A2/AD strategy should consider historical legacies and strategic cultural contexts of Indonesia that forms its idea and understanding of the concept deterrence. finally, there is already a paradigm that both offensive and defensive efforts must consider the use of geography at tactical and operational levels (Harmon, Dillon, & Garver, 2004). The previously mentioned geographic approach is taken into consideration by the current research as a possible alternative to the platform-based approach. The research defines 'Geographic-based A2/AD strategy' as a system or strategy that maximizes the use of a state's geographic character to deter and or deny adversaries from accessing its territories. The following section will discuss further what elements would be better suited to Indonesia's current situation.

Detection, Intelligence, and Independent Command Systems

The first component of a geographic-based A2/AD Strategy for Indonesia is developing maritime domain awareness emphasizing on a decentralized command and control system. The primary objective of developing a more effective surveillance and reconnaissance system is to enhance Indonesia's situational awareness of its maritime territories, enabling it to respond and deter potential threats (Fitriana, 2023). Our analysis suggests that enhancing the Indonesian early warning system and intelligence capabilities will facilitate the successful implementation of Indonesia's maritime security vision and becomes a prerequisite of Indonesia's A2/AD strategy. In line with our objective of creating a geographic-based A2/AD, we propose that detection and intelligence may be delegated to integration of passive and low-cost assets. Green Juku and Orange Juku buoys planned in Trident Shield of Nusantara program may be adopted as a low-cost yet effective solution to monitor ships passively (Fefilatiyev, Goldgof, & Shreve, 2012). In addition, Indonesia has options based on National Act No. 3 of 2002 on Indonesian National Defence to mobilize its fishermen as a civil component of maritime intelligence. This could be done with systems that could provide fishermen with access to communicate with the response forces. In this regard, detection and intelligence systems are tantamount to the practice of Indonesia's geography-based A2/AD, the research realised that it must be coupled with an effective command-and-control system (C2) based in certain geographic areas with a possibility of application in congested

maritime areas in proximity of Batam islands, which lies on one of the busiest maritime lanes (Figure 2).

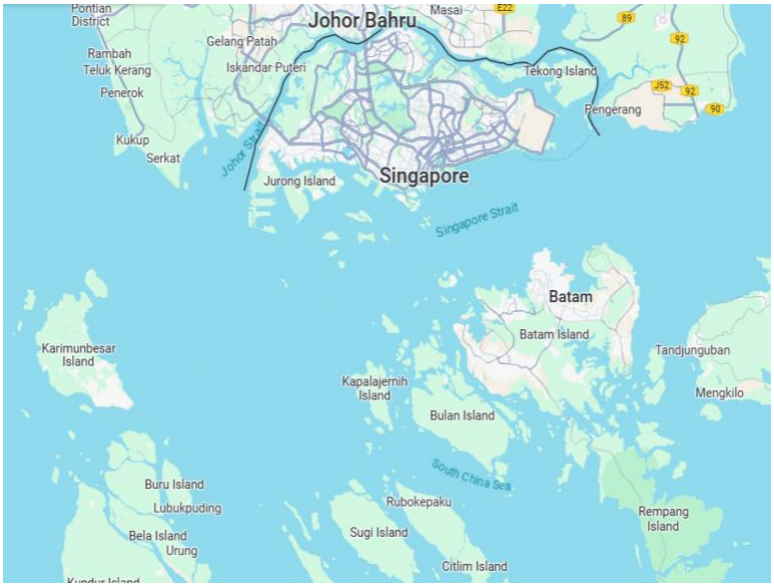


Figure 2. Area of Riau and Batam Island in Malacca Strait.

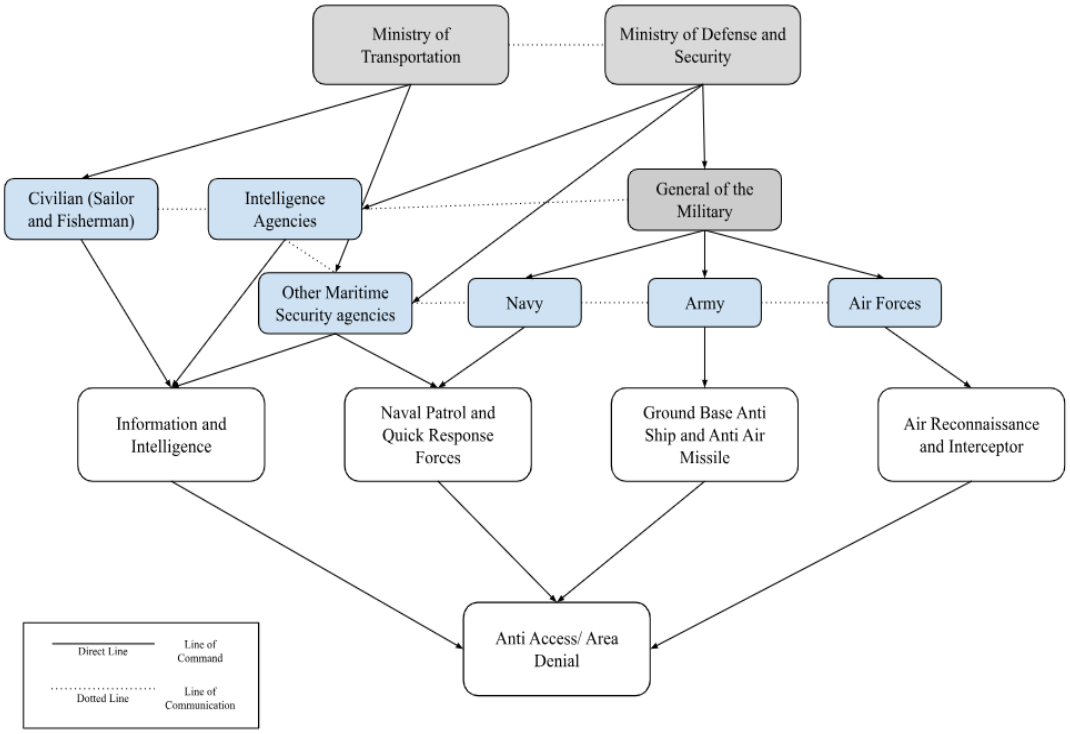


Figure 3. Diagram for the proposed integration of elements

In the assumption that Indonesia's maritime defense objectives of defence are littoral defence instead of projection (Bergstrom & Friedner, 2022), Indonesia may utilise its archipelago, exemplified by the map, to achieve A2/AD-oriented objectives; the areas around the Batam Islands subsequently present ample opportunities to build or develop naval bases and or installations to monitor said chokepoint. To increase survivability of the C2 installations, the base may be promptly bult to be well concealed or camouflaged, for example in the bays in the north of Rempang Island – or the strait between Batam and Rempang Island(s). The command structure may be given more independence; for example, given authority for limited engagement in the condition of war, so that reaction times may be expedited. This C2 system and basing should also stress the importance of great coordination and combined efforts between the Navy, air forces, and the Army. In practice, the integration of every element in the A2/AD strategies as shown in Figure 3.

Platforms of the Geographic-based A2/AD System: Low-Cost Assets and Archipelago Geography

While the geography based A2/AD scrutinised in this research suggests diversion of focus from platforms; the research acknowledges that 'platforms' themselves are required for the implementation of the strategy. We bring into attention that the procurement of platforms for Indonesian geography-based A2/AD should remain relatively low cost and base itself upon the archipelagic character of Indonesia. We consider the lessons learned in Ukraine and Iran (pre-2026 events) in the implementation of ASMs, Sea Mines, and Drones with the centrality of geography in chokepoints and SLOCs for strategic effect. Meanwhile, the application of Anti-Ship Missile(s) in the proposed geography-based A2/AD strategy is as an anti-access tool, in which land-based or ship-mounted ASMs creates a gauntlet-like standoff system to prevent and subsequently punish intrusions by the adversary, preventing actions such as amphibious operations or naval control over chokepoints. Indonesian capabilities have had been augmented with ASMs - for example, the Russian-made Yakhont Missile, which is currently installed in several Indonesian Navy ships (Collin, 2011). The use of anti-ship missiles in chokepoint defence has been proven to be cost-effective for deterrent effect as demonstrated by Iran in its strategy of area denial that involves heavy use of ASMs (Haghshenass, 2008).

Unmanned Surface Naval Attack Drones and Swarming on the Battlefield.

Naval attack drones have gained prominence in warfighting operations as an effective low-cost asset mainly in Ukraine. Troshkin stated losses from MAGURA drones alone had reached 500 million US Dollars, with relatively minimum investment (Troshkin, 2024). Main components for remote-controlled drones are, in more recent times, commonplace (often found in civilian markets) and would not compromise on the allocation of fundings. Translated into Indonesia's geographical characteristics, these drones could prove vital to increase Indonesia's naval denial capabilities, especially on chokepoints of the three SLOCs (ALKI) of Indonesia. The use of low-cost unmanned surface naval attack drones should be oriented towards creation of 'disorientation' effect on the part of the potential adversaries using swarming methods (Scharre, 2018), on the battlespace

environment. The emphasis on disorientation is intended to create a condition in which blindness occurs in regards to battlespace awareness of the potential adversaries, establishing paralysis and increase the likelihood of self-defeating and costly actions. In this regard, the utilization of swarming methods enables the weaponization of analysis paralysis by intentionally creating too much data for the adversary to effectively manage within the narrow time constraints of decision-making (weaponization of noise to signal ratio) (Jensen, 2026). In this regard, the strategic landscape of Indonesia's archipelago geography allows for the application of swarming methods using these low-cost unmanned surface attack drones due to its flexibility and concealment advantages applied in Indonesia's contexts whereas the smaller islands provide an envelopment to the larger main islands.

Sea Mines

In the event of a war emergency, the Indonesian Navy could prepare and deploy sea mines in some areas of SLOCS. Diplomatically, it would create less political friction between Indonesia and other states since the deployment of mines would only follow a pre-existing condition of war and self-defence. Despite this, the associated risks of post war damages by seaborne mines should be considered (Pedrozo, 2023). In an integrated A2/AD environment, we expect the defence systems to behave in the following manner:

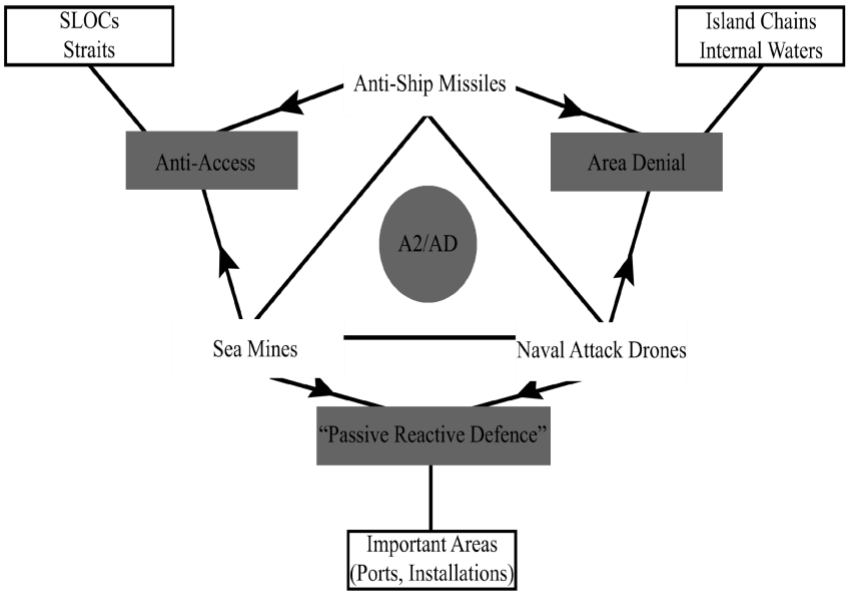


Figure 4. Proposed A2/AD Systems

The three proposed A2/AD systems will work together as a whole, but in practice, at least two of the three systems will work in concert to perform a specific function of A2/AD. ASMs and Sea Mines will be the tools for Anti-Access to prevent an adversary from gaining a foothold in

SLOCs and to prevent access to important maritime areas. ASMs and Naval Attack Drones will function as a method of area denial, especially in limiting the adversary's movement or mobility in Indonesian territories and island chains. Sea Mines and Naval Attack Drones will function as passive-reactive defence in important areas where the presence of drone-equipped forces could further bolster the sea mines' relatively limited defence capabilities as an active element in a defensive position around terrain.

A COMPARATIVE ANALYSIS OF A2/AD METHODS FOR INDONESIA

To further reinforce the arguments presented, this research compares a technological-centric approach versus a geographic-centric approach to A2/AD in relation to its relevance in the Indonesian context. The research argues that the MEF Program in which is a technological-platform centric strategy has in some respects failed to materialize a cohesive defence strategy that strikes a balance in deterrence, national economic powers and regional stability (Badan Keahlian DPR RI, 2021). It has been known that in the last stage of MEF naval procurement program, total surface ships of the Indonesian Navy did not meet expectations (Fitri & Sanur, 2019). Causally, this implies Indonesian navy fighting force may still not be enough to provide deterrence (Saputra, 2024). Lack of funding and support of government in military research and uncertainty of defence cooperation are cited as main factors of failure in compliance of MEF targets.

While the MEF is a domestic factor that demonstrates Indonesia's lack of affinity towards a technological-centric A2/AD strategy, international factors must also be taken into account. Indonesia's position in international politics is reflected in its hedging stance, colloquially known as "*bebas-aktif*" (Arief, Widjayanto, & Priyanto, 2021). This meant that an overt procurement of platforms has a greater tendency to invite inimical reactions (e.g. causing an arms race) (Ashshiddiqy, 2019), thus diminishing the effectiveness of an Indonesian high-tech oriented A2/AD strategy. Considering these factors, the research suggests that a platform-technological based A2/AD would be disadvantageous instead of beneficial to Indonesia's defence.

Meanwhile, a geography-based A2/AD has several identifiable advantages, namely a better centre of gravity – even in some regards an immovable centre of gravity for a defence strategy. This allows for structured and steadier build-up of military forces and strategic installations in Indonesian territories which in turn increases efficiency, consistency, and ability of the Indonesian military to deal with potential traditional threats, instead of over-reliance on the credibility of warfighting platforms to deter adversaries.

On the matter of a decentralised command structure for geography-based A2/AD implicated by this research, Indonesia has historically been known for decentralised guerilla fighting that characterises its national struggle for independence. The embryo of a decentralised force for Indonesia lies in the "Kodam" (*Regional Area Defense* System) (President of the Republic of Indonesia, 2016), despite the centralised-orientation of the current system. The existence of this established concept benefits the proposed A2/AD strategy in the way that

conceptual framework does not to be experimented upon, which implies relatively minor shifts instead of potentially disastrous major doctrine-conceptual shifts as seen with other countries experiences (Libel, 2010).

CONCLUSION

Indonesia's strategic position in the Indo-Pacific and the evolving regional security environment necessitates a robust and adaptable defence strategy in line with its archipelagic geography. This article argues the significance of investing in long-term maritime asymmetric strategy which integrates its distinct archipelago characteristics with the use and integration of low-tech platforms in its A2/AD development. These considerations important noting the confluence of Indonesia's strategic environment, military modernization and defence planning as well as its enduring construct on the conception of deterrence centred not on war winning strategy but rather war endurance strategy. In particular, as Indonesia is embarking on a path of force modernization of its armed forces from Minimum Essential Forces towards Joint Forces exemplified in the Trident Shield of Nusantara.

Consequently, any future imperatives towards the ideal A2/AD strategy should conform with the necessary alignments between its cognitive frameworks, strategic frameworks and operational tactical frameworks which are rooted in Indonesia's archipelagic geography, history of warfare, and the national strategic culture. In this regard, this study suggests that Indonesia in its approach to development of its distinct A2/AD strategy may not necessarily have to imitate any foreign models which are heavily invested on high-technology platforms and cost intensive. On the contrary, the nation may also develop a distinct A2/AD strategy centred on 'technological reduction' and naturally developing a force structure suitable for extensive use of low-cost assets integrated with a maritime and land component of an updated national asymmetric warfare strategy. As a whole, this study argues a need for greater reflection and rethink about future format of its A2/AD strategy in line with greater development of the Trident Shield of Nusantara noting the convergence of its strategic environment, military modernization and force structure planning as well as its conception of deterrence rooted in the nation strategic culture.

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