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Research Article

Artificial Intelligence in Indo-Pacific: Quo Vadis International Humanitarian Law and Regional Peace and Security in Southeast Asia

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ABSTRACT: The use of Artificial Intelligence in the military is like two sides of a coin. It can provide convenience and aid in military operations but has the potential to hinder military operations. Dangerous and potentially catastrophic for humanity will be inevitable as no restrictions on its use. The United States, China, Australia, Japan, and India are examples of nations whose militaries have developed artificial intelligence technology. Geographically, Southeast Asia, which is located in the middle of these nations, will experience a significant impact due to its tight maritime borders if there is no international consensus on the military application of artificial intelligence technology. An autonomous or autonomous system to operate this technology will reduce the amount of human control and allow it to operate without any human intervention. It will be a threat to the application of the fundamental principles of international humanitarian law, such as the distinction principle, and proportionality principle. Where these principles are tightly intertwined with human command and control in making decisions regarding the execution of attacks. The article employs normative legal methodology. Furthermore, this paper endeavours to assess the pertinence of principles in international humanitarian law during the era of the artificial intelligence arms race. It also delves into the contribution of ASEAN in upholding stability, peace, and security in the Southeast Asia region, thereby reinforcing the importance of this research. This research emphasises the importance of aligning the progress of artificial intelligence in military contexts with core principles of international humanitarian law. It underscores the need for ASEAN to safeguard regional peace and security by establishing a novel regulatory framework that outlines restrictions on the development and deployment of artificial intelligence for military objectives.

KEYWORDS: Artificial Intelligence; International Law; Peace and Security; Southeast Asia.

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I. INTRODUCTION

This research aims to delve into the pivotal realm of artificial intelligence (AI), particularly focusing on the escalating integration of automation within military applications by the Indo-Pacific countries, such as Australia, India, Japan and the United States. The advent of AI has ushered in a new era of autonomy, enabling machines to execute complex tasks with minimal human intervention.[1] Much akin to historical instances where the military eagerly embraced transformative technologies, today's armed forces seek to harness the potential of AI, with a specific emphasis on Autonomous Weapon Systems (AWS). [2] The significance of this research lies in unravelling the multifaceted dimensions surrounding the deployment of AWS in the military landscape. As concerns raised by non-governmental organisations, nations, academic institutions, and robotic experts mount regarding the foreseeability and legality of future AWS developments, the complexity of this issue surpasses mere technological intricacies, evolving into a perplexing global concern. [3]

Moreover, this research underscores the imperative need for a comprehensive legal framework governing the utilisation of AWS in military contexts, particularly in the Southeast Asia region. The imperative for the establishment of a comprehensive legal framework in Southeast Asia emanates from the geographical centrality of the region within the Indo-Pacific and the current absence of regulations governing the application of AI in the military context, particularly in Southeast Asia. This initiative is undertaken with the overarching goal of fostering stability, security, and peace in the Southeast Asian region.

The absence of clear regulations amplifies apprehensions, as the public perception of AWS often draws parallels to dystopian portrayals, blurring

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1 Simon Chesterman, "Artificial Intelligence and the Problem of Autonomy" (2020) 1:2 Journal of Emerging Technologies 210–250.

2 Thomas Reinhold & Niklas Schörnig, Eds, *Armament, Arms Control and Artificial Intelligence: The Janus-Faced Nature of Machine Learning in the Military Realm*, Studies In Peace And Security (Cham: Springer International Publishing, 2022).

3 Afonso Seixas-Nunes, *The Legality and Accountability of Autonomous Weapon Systems: A Humanitarian Law Perspective*, 1st Ed (Cambridge University Press, 2022).

the line between fiction and reality. This unsettling shift in perception highlights the potential real-world consequences of advanced technologies escaping the confines of speculative nightmares, prompting contemplation about humanity inadvertently surrendering control to its innovations. In elucidating the key facts of this research, it becomes evident that addressing the legal implications of AWS is paramount. The research not only sheds light on the pressing concerns surrounding military AI but also advocates for a robust legal framework to guide the responsible development and deployment of AWS, ensuring the preservation of ethical standards and human control over these advanced technologies.

The exploration of pressing concerns surrounding military AI, as outlined in the preceding paragraph, sets the stage for a deeper examination of the transformative potential embodied by AWS. A critical extension of this discourse involves contemplating the implications of AWS potentially replacing human troops, thereby constituting what has been termed a "third revolution in military affairs" because they would be able to acquire their data, draw their conclusions,[4] and make decisions regarding deadly targeting without the need for human intervention.[5] AI arms race refers to the phenomenon of numerous nations developing AI technology for military purposes.

Towards the close of the year 2010, the State Council of China divulged a comprehensive strategy aimed at elevating China to the status of a global leader in the field of artificial intelligence (AI) by the year 2030.[6] In the following two years, Ashton B. Carter, serving as the United States Deputy Secretary of Defence, formally authorised the issuance of the Department of Defence Directive on autonomous weapon systems, signalling the U.S. government's significant step towards addressing AI in defence

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4 Simon Chesterman, *We, the Robots?: Regulating Artificial Intelligence and The Limits of the Law*, 1st Ed (Cambridge: Cambridge University Press, 2021).

5 Magdalena Pacholska, "Military Artificial Intelligence and the Principle of Distinction: A State Responsibility Perspective" (2023) 56:1 Israel Law Rev 3–23.

6 Matthew E Castel, "The Road to Artificial Super-Intelligence: Has International Law A Role to Play?" (2016) 14:1 Canadian Journal of Law and Technology 1–14.

technologies.[7] These policies aim to establish a Department of Defence policy regarding the "development and use of autonomous and semi-autonomous functions in weapon systems" and "guidelines designed to minimise the probability and consequences of failures in autonomous and semi-autonomous weapon systems that could result in unintended engagements." In addition to the United States and China, Japan, Russia, Australia, and India are also developing artificial intelligence technology for military purposes. Geographically, the Indo-Pacific is home to the majority of nations aggressively developing AI technology for military use. If there is no agreement on the proper use and application of AI in the military world, the Indo-Pacific will revert to an "arms race playground" similar to the nuclear playground of the twenty-first century. Southeast Asia's location in the heart of the Indo-Pacific necessitates that the nations of the region take steps to ensure their security.

To prevent undesirable consequences, the deployment and utilisation of autonomous weapons adhere rigorously to the tenets of international humanitarian law. The framework of international humanitarian law is underpinned by a set of fundamental principles, which constitute its bedrock and must be upheld at all costs. Considering the incorporation of artificial intelligence into military applications, it becomes unequivocal that its utilisation must remain consistent with the foundational tenets of international humanitarian law. Nonetheless, it is crucial to acknowledge that the integration of artificial intelligence in military operations can potentially reduce or eliminate human involvement in the control and decision-making processes related to weaponry. This development raises significant concerns, as any misuse or inadvertent errors in autonomous weapon systems could result in grave consequences, thereby jeopardising the safety and well-being of humanity at large. Such errors could be the result of the weapon system itself, or made by a human. For example, the control system of an Autonomous Weapon System (AWS) is a key component of the 'kill chain,' encoding decision processes related to attack precautions and

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[7] Kenneth Anderson & Matthew C Waxman, *Debating Autonomous Weapon Systems, Their Ethics, and Their Regulation under International Law*, Roger Brownsword, Eloise Scotford & Karen Yeung, Eds (Oxford University Press, 2017).

target selection. The deployment of an AWS, as opposed to a manually operated weapon, can impact the decision-making process and the execution of attacks under varying circumstances which could target civilians indiscriminately. In another instance, AWS may be unintentionally misconfigured, either by the developer or by other personnel configuring the weapon system before use, such that its targeting system identifies a civilian as a valid target.[8]

Under international humanitarian law, some principles are established to signify the role of 'humanity' in underlying a conflict. Such principles are well known as the principle of distinction and proportionality. Under the principle of distinction, it is necessary to make a distinction between civilians and combatants in the world of war, and under the principle of proportionality, it is necessary to ensure that war does not cause unjustifiable losses and damages. Therefore, the likelihood of violations of the three fundamental principles of international humanitarian law will increase if the role of humans in weapon control and decision-making in the military is diminished or eliminated. Currently, the international community is actively considering regulations for the military use of AI. The Franco-German initiative, backed by varying degrees of support from EU member states, proposes a multilateral approach, advocating for a politically binding declaration on AWS.[9] While gaining traction, notable divergences exist between France, favouring a soft law instrument, and Germany, envisioning intermediate steps towards binding tools. The majority of countries in Group of Governmental Experts (GGE) meetings call for a "legally binding international instrument," but concrete steps encounter challenges.[10]

A significant initiative by Austria, Brazil, and Chile, endorsed by over sixty countries in the Convention on Certain Conventional Weapons (CCW), proposes a mandate to negotiate a legally binding instrument ensuring

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[8] Timothy McFarland, *The Status of Autonomous Weapon Systems under International Humanitarian Law* University Of Melbourne, 2017).

[9] Daniele Amoroso & Guglielmo Tamburrini, "In Search of the 'Human Element': International Debates on Regulating Autonomous Weapons Systems" (2021) 56:1 The International Spectator 20–38.

[10] Bonnie Lynn Docherty, *New Weapons, Proven Precedent: Elements of and Models For A Treaty on Killer Robots* (New York: Human Rights Watch, 2020).

human control over lethal autonomous weapon systems.[11] The proposal and discussion papers represent tangible steps in guiding future negotiations, but the journey from proposal to effective regulation remains complex and ongoing within the international community. International legal instruments governing the use and application of artificial intelligence in the military are urgently required on a global and regional scale.

Previous research has been done to discuss the interplay between the burgeoning AI arms race and the framework of international humanitarian law. Justin and Garcia report that autonomous weapons technologies, driven by artificial intelligence, are rapidly advancing without sufficient public debate or accountability. This lack of scrutiny is concerning as these weapons could proliferate quickly, enhance terrorist tactics, empower authoritarian rulers, and be vulnerable to bias, hacking, and malfunction. The United States is currently the world leader in the development of lethal autonomous weapons, followed by China, Russia, South Korea, and the European Union. These countries have made significant investments in advanced robotics and AI research. The consequences of bias and errors in AI-based weapons could be devastating. It is crucial to have greater debate and accountability in this area.[12] Additionally, Kanok Bunnag examines the competitive behaviour between the United States and China in the global pursuit of Artificial Intelligence (AI) and its implications for ASEAN countries, particularly Thailand. It discusses the concept of an AI arms race and explores the potential benefits for ASEAN nations in terms of military modernisation. He also suggests measures for Thailand's armed forces and defence industry to establish AI capabilities and discusses strategic partnerships with the US and China in the context of the AI arms race.[13] At last, Wyatt and Galliott discuss the rise of autonomous weapon systems in Southeast Asia and the potential for ASEAN to develop a regionally appropriate framework for their

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[11] Vincent Boulanin & Maaike Verbruggem, *Mapping The Development of Autonomy in Weapon Systems* (Stockholm: Stockholm International Peace Research Institute, 2017).

[12] Justin Haner & Denise Garcia, "The Artificial Intelligence Arms Race: Trends and World Leaders in Autonomous Weapons Development" (2019) 10:3 Glob Policy 331–337.

[13] Kanok Bunnag, "Artificial Intelligence Arms Race: Opportunities for ASEAN and Thailand's Defence Capability" 13:1.

development. It highlights the current status of unmanned aerial and maritime vehicles, their capabilities, and their impact on regional security. The paper also emphasises the need for international discussions and the development of norms to address ethical and legal concerns surrounding the deployment of unmanned systems and the broader context of military modernisation within the ASEAN region in the era defined by the rapid advancements in AI technology. [14] Building upon these insightful investigations, we aim to provide a comprehensive analysis of the implications of the AI arms race on international humanitarian law and regional peace and security in Southeast Asia. This study endeavours to bridge existing gaps, offering a nuanced understanding of the challenges and opportunities presented by the proliferation of AI in the Southeast Asia region.

The objective of this study is to thoroughly investigate the compatibility of AI and Autonomous Weapon Systems (AWS) deployment with the foundational tenets of humanitarian law. In doing so, it aims to furnish comprehensive insights into viable strategies and approaches that ASEAN, positioned at the strategic core of the Indo-Pacific, can adopt to mitigate the risk of becoming a potential theatre for an arms race among nations within the Indo-Pacific vicinity in the future. Due to the paucity of relevant prior research, these two points are novel to this study. Using data from the United States, Australia, Japan, India, and China, we examine the development of AI arms technology in the Indo-Pacific. The basis for choosing these countries due that the data indicates that these nations are eager to dominate AI arms technology to protect and preserve their countries. In addition, the data serves as evidence that the arms race in the Indo-Pacific may endanger the peace and security in Southeast Asia. Then, we examine the application of the fundamental principles of humanitarian law in the context of AI weapons technology. This section explains whether or not the current IHL regime is sufficient to address the challenges. This research leads us to the conclusion that Southeast Asia needs a regional regulatory framework.

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[14] Austin Wyatt & Jai Galliott, "Closing the Capability Gap: ASEAN Military Modernization During the Dawn of Autonomous Weapon Systems" (2020) 16:1 Asian Security 53–72.

II. METHODOLOGY

This study used doctrinal research. The literature study will scrutinise the primary and secondary sources of law related to the relevance of international humanitarian law principles in artificial intelligence, and the role of ASEAN in maintaining stability, peace and security in the Southeast Asia region. This research used data from Australia, India, Japan and the United States to examine the development of AI in the military context and to examine their municipal law in AI for military purposes.

III. THE DEVELOPMENT OF AI ARMS TECHNOLOGY IN INDO-PACIFIC

Regional powers in the Indo-Pacific have sought to use technology to improve the quality and quantity of their militaries, making it a major factor in the ongoing arms race. This has led to the conception, development, and introduction of new weapon systems and platforms with greater range, precision, and capacity to counter enemy countermeasures. In this chapter, the author would like to explain the development of AI arms technology in Indo-Pacific countries, including the US, Australia, Japan, India, and China.

A. The United States

In 2014, the Secretary of Defence Chuck Hagel launched a third offset strategy, aimed at restoring U.S. military technological superiority.[15] The first offset strategies, launched in the 1950s, were associated with the United States' investment in nuclear weapons.[16] The Second Offset Strategy has been in place since the 1970s and has a focus on precision-guided weapons.[17] The main focus of the Third Offset Strategy is robotics and autonomy, where

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[15] Peter Dombrowski, *America's Third Offset Strategy: New Military Technologies and Implications for the Asia Pacific* (Singapore: RSIS: S. Rajaratnam School of International Studies, 2015).

[16] Gian P Gentile et al., *A History of the Third Offset, 2014-2018* (Santa Monica, Calif.: Rand Corporation, 2021).

[17] *Ibid*.

AI plays a crucial role.[18] The focus of the Third Offset Strategy is largely due to the presence of the world's largest and most advanced technology companies, such as Google, Amazon, Apple, Facebook and Microsoft. However, in artificial intelligence, the US is currently the world leader.[19]

From a military perspective, artificial intelligence is also a revolution for the military power of the state. Pentagon acknowledges that advances in artificial intelligence "are going to change society and, eventually, warfare."[20] AI constitutes a domain of engineering that exerts substantial influence on matters of national security. Notably, the United States has emerged as a frontrunner in harnessing AI applications for military purposes. To illustrate this assertion, this subsection will delineate some of the pivotal tests and experiments conducted by the U.S. in this regard. In 2013, a significant milestone was achieved when the U.S. Navy's X-47B prototype drone successfully executed autonomous landings. Subsequently, in 2016, the United States showcased its technological prowess by orchestrating the synchronised flight of 103 autonomous drones, a feat demonstrating the country's strides in AI-driven military capabilities. Similarly, in November 2016, the U.S. Navy conducted a noteworthy experiment involving a swarm of five unmanned boats patrolling a designated area of the Chesapeake Bay, effectively halting an "intruder" vessel, thus underlining AI's role in maritime security. Furthermore, U.S. military branches have been diligently engaged in the integration of AI into various semi-autonomous and autonomous platforms, spanning fighter jets, drones, ground vehicles, and naval vessels. The Loyal Wingman program stands as a compelling exemplar of these endeavours.[21]

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18 Gloria Shkurti Özdemir, *Artificial Intelligence Application in the Military the Case of the United States and China* (Istanbul: Seta, 2019).

19 Gabriele Reitmeier, *Licence To Kill: Artificial Intelligence in Weapon Systems and New Challenges for Arms Control*, Policy Paper (Potsdam: Friedrich Naumann Foundation for Freedom, 2020).

20 Justin Sherman, *Essay: Reframing The U.S.- China Ai "Arms Race": Why This Framing Is Not Only Wrong But Dangerous for American Policymaking* (United States of America: New America's Cybersecurity Initiative, 2019).

21 Özdemir, *supra* note 18.

Several policy documents related to AI and the military have been documented, in addition to the testing of several types of AI products for military use. In November 2012, the Pentagon published "Directive 3000.09," its first official directive on autonomy in weapons systems. Moreover, a new 2018 military AI strategy: "Harnessing AI to Advance Our Security and Prosperity" was created. Ensuring U.S. military and technological superiority over its strategic competitors is the primary goal of this new strategy. In February 2020, five principles of AI were presented to the public: "to be responsible, equitable, accountable, reliable, and governable," suggesting that humans should remain responsible for the development, distribution, deployment, and outcomes of AI.[22] Nevertheless, as observed by a scholar affiliated with West Point, the United States military's foray into the realm of artificial intelligence raises pressing inquiries concerning its capacity to evolve its cultural and institutional framework to effectively harness emerging technologies. In a broader context, the degree of receptiveness demonstrated by the U.S. defence establishment toward embracing cultural and operational transformations will wield significant influence over the seamless integration of artificial intelligence within the fabric of the U.S. military infrastructure.[23]

Furthermore, federal laws have been enacted in recent Congresses that address or include provisions related to artificial intelligence (AI). The most comprehensive legislation is the National Artificial Intelligence Initiative (NAI) Act of 2020.[24] Since the FY2019 John S. McCain NDAA, NDAAs have included provisions that focus on AI in the defence, national security, and intelligence communities each year. The first definition of AI in federal statute was included in the FY2019 John S. McCain NDAA. These provisions have focused on AI development, acquisition, and policies; AI data repositories; recruiting and retaining personnel in AI; and

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[22] Reitmeier, *supra* note 19.

[23] Sherman, *supra* note 20.

[24] Laurie A Harris, *Artificial Intelligence: Overview, Recent Advances, And Considerations For The 118th Congress* (Congressional Research Service, 2023).

implementing recommendations from the 2021 final report of the National Security Commission on AI.[25]

B. Australia

Australia's approach to artificial intelligence hinges on its categorisation based on specific attributes, namely the ability to sense, learn, predict, and autonomously execute actions in pursuit of predetermined objectives, whether guided by human instruction or not. While Australia does not possess a formalised defence strategy explicitly centred on artificial intelligence, it has accorded paramount importance to the advancement of AI capabilities within various domains. These encompass robotics, autonomous systems, precision-guided munitions, hypersonic weaponry, integrated air and rocket defence systems, space exploration, as well as critical infrastructure and cybersecurity. Within this spectrum, robotics and autonomous systems occupy a pivotal role, functioning as potent force multipliers that serve to safeguard both personnel and valuable assets.[26]

In certain respects, the influence of military automation has already become manifest. An illustrative instance occurred during the Nagorno-Karabakh conflict in 2020 when a synergistic combination of unmanned aerial vehicles (UAVs), electromagnetic sensors, and precision munitions yielded decisive outcomes against traditional armoured forces.[27] On February 27, 2021, a significant milestone in autonomous aviation was achieved when the Australian military aircraft, Loyal Wingman, demonstrated its capacity for entirely autonomous flight at the Woomera Range Complex in South Australia. Operating along a pre-programmed route and remotely monitored, the aircraft executed its mission devoid of human presence. The successful demonstration, coupled with the Royal Australian Air Force's procurement of six such aircraft, unequivocally signalled Australia's strategic

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[25] *Ibid.*

[26] Damian Copeland, "Australia's Approach to AI Governance in Security and Defence" in *the AI Wave in Defence Innovation*, 1st Ed (Routledge, 2023).

[27] Alex Neads, Theo Farrell & David J Galbreath, "Evolving Towards Military Innovation: AI and the Australian Army" (2023) 46:2 Journal of Strategic Studies 1–30.

intent to harness artificial intelligence (AI) to augment its military's autonomy and manoeuvrability.[28] Australia's motivation for embracing military automation is fundamentally grounded in strategic apprehensions regarding shifts in regional power dynamics. The Robotic and Autonomous Systems Strategy, introduced in 2018, underpins an anticipated AU$55 billion investment in novel land-based systems, including a commitment to acquire a sufficient quantity of new UAVs and robotic ground vehicles to outfit an entire brigade.[29]

Crucially, there is no specific legislation governing AI for Australian defence or military purposes and to date, broad coverage has fallen to Australian domestic legislation covering privacy, company law, intellectual property law and data security law.[30] This creates a less-than-optimal situation that requires multiple legislative instruments to cover the regulatory aspects of AI in Australia, including in the military and defence fields.

C. Japan

Japan's interest in AI technology extends beyond civilian applications, driven in part by labour shortages stemming from an aging demographic landscape. Within the realm of defence, the Japanese Ministry of Defence (JMOD) regards AI as a pivotal component of what it terms "game-changing technologies" for the future of warfare. As early as 2019, Tokyo had laid out plans for the acquisition and development of multiple unmanned vehicles and underwater drones, as articulated in its white paper titled "Defence of Japan 2021," which called for an augmentation of the technological foundation supporting defence applications. This marked a significant departure, considering Japan's defence establishment had remained largely

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[28] Copeland, *supra* note 26.

[29] Neads, Farrell & Galbreath, *supra* note 27.

[30] Sascha-Dominik Dov Bachmann & Richard V Grant, "The Need for an Australian Regulatory Code for the Use of Artificial Intelligence (AI) in Military Application" (2023) 13:2 American University National Security Law Brief 1–34.

excluded from scientific and technological advancements since the conclusion of World War II.[31]

Japan is actively engaged in a competitive pursuit of AI development and deployment for military purposes, aligning itself with other prominent global powers in this endeavour. To foster a comprehensive AI ecosystem, Tokyo has introduced an AI technology strategy structured around a three-phase blueprint. The Japanese government envisions the amalgamation of AI with other cutting-edge technologies, encompassing the Internet of Things, autonomous vehicles, and the seamless integration of cyberspace and physical domains, leveraging its substantial achievements in robotics. In the fiscal year 2021, Japan's Air Self-Defence Force embarked on the deployment of US Global Hawk unmanned aerial vehicles, concurrently establishing a specialised drone handling unit.[32]

Japan does not have any regulations that generally restrict the use of AI. The AI Governance in Japan Ver. 1.1 report, published by the Ministry of Economy, Trade, and Industry (METI) in July 2021, comprehensively describes Japan's AI regulatory policy, such as "legally-binding horizontal requirements for AI systems are deemed unnecessary at the moment".[33] Regulations face difficulties in keeping up with the speed and complexity of AI innovation. However, some laws remain relevant for AI's development and use, such as The Act on the Protection of Personal Information (APPI), which describes the key mandatory obligations for organisations that collect, use, or transfer personal information.[34]

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[31] Wichuta Teeratanabodee, "Military AI Governance in East Asia: Advances and Challenges."

[32] Chai Hong, "Japan to Beef Up Deploying AI Technology in Military Defense", (2 December 2019), online: *China Daily* <https://www.chinadaily.com.cn/a/201902/12/ws5c6226caa3106c65c34e8dac.html>.

[33] Hiroki Habuka, *Japan's Approach to AI Regulation and Its Impact on the 2023 G7 Presidency* (The Center for Strategic and International Studies, 2023).

[34] *Ibid*.

D. India

India lags behind many other countries in terms of applying AI to defence. However, India is now trying to make AI a reality in the military sector. The Army, Navy and Defence Research and Development Organisation (DRDO) are all focusing on ensuring the effective use of AI in decisions, surveillance, and weapons systems.[35] India is at the forefront of AI development and procurement to strengthen its military infrastructure.

Some examples of Indian military AI capabilities include AI-enabled robots such as Robosens for ISR operations, miniaturised man-portable walking robots for logistics support, cognitive robots for maintenance and upkeep of parts, unmanned aerial vehicles such as Black Hawks, smart chairs, and the NETRA (Network Traffic Recorder) system for live monitoring of Internet traffic.[36] India's drone capabilities include Botlab Dynamics swarm drones, HAL and NRT's Air-Launched Flexible Asset Swarm (ALFA-S), and DRDO's Rustom 1 swarm drones.[37]

India has taken significant steps toward advancing its engagement with AI, as evidenced by the establishment of technology hubs, national laboratories, test centres, and specialised working groups dedicated to AI research and development. Nonetheless, there exists a critical imperative for India to integrate defence AI capabilities into its overarching national AI strategy, which, at present, primarily focuses on the commercial and private sectors. The global landscape underscores the importance of this endeavour, as major powers recognise the necessity of harnessing their military establishments to

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[35] Nikhat Parveen, "Artificial Intelligence in India's Military Sector: Efforts and Future Prospects" (2022) 10:9 International Journal of Creative Research Thoughts 955–963.

[36] Satavisa Pati, "Use of Artificial Intelligence by Indian Army in the Borders in 2021", (20 October 2021), online: *Analytic Insight* <https://www.analyticsinsight.net/use-of-artificial-intelligence-by-indian-army-in-the-borders-in-2021/>.

[37] Sanur Sharma, "Beating Retreat and Demonstration of Drone Power | Manohar Parrikar Institute For Defence Studies And Analyses", (25 January 2022), online: *Manohar Parrikar Institute for Defence Studies and Analyses* <https://www.idsa.in/idsacomments/beating-retreat-and-demonstration-drone-power-sanur-250122>.

harness the potential of emerging intelligent technologies, thus preserving strategic stability and bolstering deterrence mechanisms.[38]

Currently, India does not have a comprehensive law governing artificial intelligence. The government has implemented piecemeal policies to protect certain aspects of AI, such as data privacy and localisation. However, there has been little discussion on possible regulatory issues beyond these, particularly in the defence and security sectors.[39] India needs to develop a comprehensive regulatory framework for AI to ensure its ethical and responsible development. Moreover, India is one of the countries that is massively transforming AI-based military technology.

E. China

AI is a top priority for the Chinese leadership as a core aspect of national and military power. China has adopted a "Next Generation Artificial Intelligence Development Plan." Its goal is to become a world leader in AI by 2030. The PLA is continuing to develop “smart” and autonomous weapon systems, including unmanned aerial, surface, and underwater vehicles, as well as military robotics and cruise missiles. As the Chinese defence industry begins to incorporate higher levels of autonomy into its high-end UAVs, it is also pursuing options for manned-unmanned teams and multi-UAV operations.[40] Regarding aerial AUVs, China has been quite successful, especially when it comes to swarming drones. In June 2017, China managed to fly a swarm of 119 drones, all equipped with systems that allowed drones to communicate with each other.[41]

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[38] Sanur Sharma, *Artificial Intelligence In Warfare* (New Delhi: The Lok Sabha Secretariat, 2022).

[39] Rajesh Chakrabarti & Kaushiki Sanyal, “Towards A ‘Responsible AI’: Can India Take The Lead?” (2020) 21:1 South Asia Economic Journal 158–177.

[40] Elsa B Kania, *China’s Rise In Artificial Intelligence And Future Military Capabilities*, Battlefield Singularity (Center For A New American Security, 2017).

[41] Emily Feng & Charles Clover, “Drone Swarms vs Conventional Arms: China’s Military Debate”, *Financial Times* (24 August 2017), online: <https://www.ft.com/content/302fc14a-66ef-11e7-8526-7b38dcaef614>.

TYW-1 and ASN-216 are two examples of Chinese unmanned aerial vehicles (UAVs) that are now able to operate autonomously with the help of AI. However, they are not fully autonomous. At present, both the ASN-216 and the TYW-1 can take off and land without any human intervention, and the TYW-1 can even identify and attack a target with a minimum of human intervention.[42] In terms of unmanned surface vehicles, SeaFly is an example worthy of mention. Currently, SeaFly can learn to avoid obstacles without human intervention, and at the same time, it can recover the UAV by using algorithms that allow SeaFly to adjust its actions based on its assessment of sea conditions.[43]

In July 2017, China's State Council issued the Next Generation Artificial Intelligence Development Plan. While the main focus is on driving economic growth through AI technology, the Plan also states that "by 2025, China will see the initial establishment of AI laws and regulations, ethical norms and policy systems, as well as the establishment of AI security assessment and control capabilities."[44] Nevertheless, in June 2023, China's State Council announced that it would begin preparations for a draft Artificial Intelligence Law to be submitted to the National People's Congress. Chinese scholars anticipate that the law will build on existing regulations to create a more comprehensive piece of legislation that acts as a capstone on Chinese AI policy.[45]

IV. AI ARMS TECHNOLOGY AND COMPLIANCE WITH FUNDAMENTAL PRINCIPLES OF IHL

AI can be defined as computer systems able to perform tasks that traditionally only humans could perform, such as rational reasoning,

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[42] Kania, *supra* note 40.

[43] Özdemir, *supra* note 18.

[44] Moises Barrio Andres, "Towards Legal Regulation of Artificial Intelligence" (2021) 15:48 Ius Mx.

[45] Matt Sheehan, *China's Ai Regulations And How They Get Made*, Working Paper (Washington, DC: Carnegie Endowment for International Peace, 2023), online: <https://carnegieendowment.org/files/202307-sheehan_chinese%20ai%20gov.pdf>.

problem-solving and decision-making. [46] Algorithms, which are mathematical instructions designed to carry out a particular activity, serve as the basis for it.

AI also refers to computer systems that are intended to replicate human cognitive functions. It includes machine learning where algorithms detect patterns in data and apply these new patterns to automate certain tasks. Machine Learning involves developing algorithms through statistical analysis of large datasets of historical examples. In a simpler sense, it could be understood that machine learning is a part of AI. It is a variant using artificial neural networks, a technique within the field of AI that has been responsible for most of the progress that AI has made in the commercial sector over the last decade.

AI technologies have a wide range of applications, including but not limited to video games, finance, and the targeting of internet advertisements; healthcare; public welfare policy; border control; and the criminal justice system. Inevitably, the presence of AI has raised questions about their position in the legal context. For some, AI is considered an inventor, a human tool, or even an entity that may become a legal subject. [47] In this context AI is viewed as a facilitator that has the potential to be utilised across various sectors of the military, across land, sea, air, and space domains, as well as at various levels of warfare, spanning from the political to the operational and tactical realms.[48]

A. AI and Autonomous Weapon System

One of the most contentious areas of application for artificial intelligence is in the military. The popular imagination and worries about the rise of machine warfare have contributed to the proliferation of public discourse on

[46] Bérénice Boutin, "State Responsibility in Relation to Military Applications of Artificial Intelligence" (2023) 36:1 Leiden Journal of International Law 133–150.

[47] Ulil Afwa, Nurani Ajeng Tri Utami & Agus Mardianto, "The Ethical Bias of Artificial Intelligence as a Subject of Law in Indonesia" (2021).

[48] Peter Svenmarck, et al, *Possibilities and Challenges for Artificial Intelligence in Military Applications* (Sweden: Swedish Defence Research Agency).

AWS, which defined weapon systems as 'that, once activated, can select and engage targets without further intervention by a human operator'.[49]

The AI use in military activities, encompassing advanced logistics, semi-autonomous convoys, intelligent supply-chain management, and predictive maintenance systems, signifies immediate and upcoming applications of AI.[50] Nevertheless, the progression towards autonomous weaponry capable of targeting individuals in land, sea, air, space, and cyber domains, either with or without human intervention, appears to be the probable trajectory for future military conflicts.[51]

It is important to underline that not all autonomous weapons incorporate AI in their system. An autonomous weapons system that utilises machine learning capabilities is often called "Learning AWS". Such AWS which integrate AI into their system is usually installed to assist in 'automatic target recognition' which at the same time forms the basis of the future of autonomous weapon systems.[52]

According to the ICRC, the presence of AI among parties to an armed conflict would at least implicate in three ways. The increasing autonomy in robotic weapons systems, new means of cyber warfare, and changing the nature of decision-making in armed conflict. An autonomous weapon system in this sense means that the AI can operate 'critical functions' of selecting and attacking their targets which could potentially eliminate total human control over such weapons.[53] Such elements of human control are crucial in the context of weapon parameters, controls on the environment as well as through human-machine interaction.

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[49] Merel Ac Ekelhof, "Complications of a Common Language: Why It Is So Hard To Talk about Autonomous Weapons" (2017) 22:2 Journal of Conflict and Security Law 311–331.

[50] Major Bradley Perry, "Autonomous Convoys," Canada (2021).

[51] Daniel Araya & Meg King, *The Impact of Artificial Intelligence on Military Defence and Security* (Ottawa: The Centre for International Governance Innovation, 2022).

[52] ICRC, *Group of Governmental Experts of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be Deemed to be Excessively Injurious or to Have Indiscriminate Effects* (Geneva: ICRC, 2018).

[53] *Ibid*.

The weaponisation of AI is also prompting the development of new techniques and ways of combating AI systems. Just as cyber operations (whether espionage or attack) can educate computer networks or devices to behave in unexpected ways, adversaries might employ the same strategy against AI systems. This approach, known as adversarial machine learning, tries to uncover and exploit flaws in machine-learning models. Attacks can occur throughout the development or deployment stages, and they can include deceiving models by providing deceptive input (for example, "poisoning" data) or targeting the model itself.[54]

Thus, AI in weaponry introduces unpredictability, particularly when deep neural learning is used. AI can misidentify or overlook targets, generate abstract images, and classify them as human faces. Predictability is crucial for LAWS to execute predetermined commands, but empirical testing is unfeasible in warfare. Machines cannot differentiate between armed combatants and non-belligerent civilians, and in the wrong hands, they could be misused to empower authoritarian governments or non-state armed groups. This raises concerns about the potential for incomplete control and misuse.

B. AWS Compliance with IHL

Currently, there are no provisions in international humanitarian law that address autonomous weapon systems. However, any fully autonomous weapon system must be designed and employed in compliance with international humanitarian law. Each nation that develops, deploys, or uses weapons is primarily liable for compliance. However, those who plan, decide, and execute attacks are the intended recipients of IHL's rules on the conduct of hostilities, such as the rules of distinction, proportionality, and precautions in attack.

In the context of IHL, the international community agrees that the use of AI whether as a part of physical or cyber-weapon must always enable

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[54] Araya & King, *supra* note 51.

combatants to make their judgements.[55] The role of human responsibility is inseparable from the use of AI in situations of armed conflict.

The primary legal responsibilities of a commander or operator when employing a weapon system are to: (1) distinguish between military objectives and civilian objects; (2) distinguish between active combatants and those hors de combat; and (3) assess whether the attack is likely to cause excessive incidental civilian casualties and damage to civilian objects, or a combination thereof, about the concrete and direct military advantage. When using weapons in attacks, human combatants have obligations under these IHL rules; they must abide by these rules and will be held accountable if they do not. Infractions of international law cannot be attributed to an algorithm, computer program, or weapon system.

To ensure that an attack using an autonomous weapon system complies with international humanitarian law, those planning, deciding, and executing the attack must take precautions to preserve their ability to make pertinent legal determinations. If an autonomous weapon system prevents commanders or operators from making these legal determinations, international humanitarian law (IHL) concerns will be raised. If, for example, an autonomous weapon system enables one to search for targets over a large area and an extended period without human supervision and communication, neither the commander who authorised the launch nor the operator who activated the weapon will know when or where an attack will occur. It raises concerns regarding their future capacity to maintain differentiation, determine sufficiency, and implement preventative measures.

V. REGIONAL DEVELOPMENTS ON THE GOVERNANCE OF AI FOR MILITARY USE

[55] See, For Example, the partnership on AI's focus on the safety of AI and machine learning technologies as "an urgent short-term question, with applications in medicine, transportation, engineering, computer security, and other domains hinging on the ability to make AI systems behave safely despite uncertain, unanticipated, and potentially adversarial environments." Partnership on AI, "Safety-Critical AI: Charter", 2018.

The presence of AI triggers a significant transformation in the realm of military technology and the global distribution of power. Such rapid development underscores the necessity for national defence strategies. Within the context of competition between major powers, AI has become a crucial asset. Nations like China, Russia, the United States, and numerous others are actively pursuing AI capabilities, particularly with a strong emphasis on defence and security.[56]

Within the regional context, states in the Southeast Asian region are also starting to develop and integrate AI capabilities into their military. Fueled by regional (territorial) disputes between member states, the advancement of the military system becomes a powerful tool to defend and secure the nation. In contrast, the European region has shown rapid development towards AI investments and legal policies. Member states of the EU have started to invest in AI military programs for the past decade. Despite so, both regions are still in the absence of a binding regulatory framework to govern the use of AI military systems.

A. Association of Southeast Asian Nations

Many ASEAN countries have started pursuing military modernisation to generate strength for strategic deterrence. With previous and ongoing territorial disputes within Southeast Asia, ASEAN members are concerned about neighbouring states' military capabilities. The dispersion of material capabilities in other states compared to their own generates doubt about member states' motives, resulting in interactive arming within the region.

Cutting-edge technologies such as AI and AI-enabling technologies will benefit states that already have a research and development (R&D) base and are willing to invest in their forces to get a first-mover advantage. However, due to limited budgets and resources, ASEAN countries are still at the beginning of incorporating AI into military applications. As a result, the ASEAN military does not see AI as a decisive strategic weapon, but rather as a crucial enabler for supporting capabilities such as big data analytics,

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[56] Araya & King, *supra* note 51.

Intelligence Surveillance and Reconnaissance (ISR), and command and control.[57]

Nonetheless, looking at engagement in disarmament regulatory frameworks can provide an overview of Southeast Asia's regional preparedness in terms of the application of AI in military weapons. In Southeast Asia, participation in disarmament agreements is diverse. Although the sub-region is known for enacting and putting into effect pertinent laws before signing and ratifying international agreements, the Convention on Cluster Munitions is not as widely accepted as other agreements. [58] Many non-signatories—Most notably Myanmar, which has not ratified any agreements other than the Prohibition on nuclear weapons—are beset by internal armed conflicts.

At present, there are no discussions at the ASEAN level or among ministers specifically focused on Lethal Autonomous Weapons Systems (LAWS). While the Non-Aligned Movement (NAM) has issued statements on LAWS during UN Convention on Certain Conventional Weapons (CCW) meetings, these statements primarily express concerns about the ethical and moral aspects of their use. It is expected that LAWS, along with their early stages of development, will uniquely affect each Southeast Asian nation.[59]

The closest ASEAN collective stance on Lethal Autonomous Weapons Systems (LAWS) is discernible from the declarations made by the Non-Aligned Movement (NAM) in the Group of Governmental Experts (GGE) meetings.[60] NAM, composed of developing countries that historically sought independence from major power influences, maintains nonalignment. During the November 2017 GGE meeting, NAM presented a working

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[57] Bunnag, *supra* note 13.

[58] Human Rights Watch, "Precedent For Preemption: The Ban on Blinding Lasers as a Model for a Killer Robots Prohibition", (8 November 2015), online: <https://www.hrw.org/news/2015/11/08/precedent-preemption-ban-blinding-lasers-model-killer-robots-prohibition>.

[59] Mitzi Austero, et al, *Artificial Intelligence, Emerging Technology, and Lethal Autonomous Weapons Systems: Security, Moral, and Ethical Perspectives in Asia* (Philippine: Nonviolence International Southeast Asia, 2020).

[60] Ingvild Bode & Hendrik Huelss, "Autonomous Weapons Systems and Changing Norms in International Relations" (2018) 44:3 Review of International Studies 393–413>.

paper to guide discussions emphasising that deliberations about LAWS and semi-autonomous weapons should consider their compliance with International Humanitarian Law (IHL). NAM stressed that states should be accountable for any illegal actions by LAWS, prompting ethical and moral considerations. NAM also expressed concerns about the proliferation of LAWS among states, potentially fuelling an arms race and endangering global peace and security. NAM suggested that discussions explore the possibility of a legally binding instrument to regulate LAWS.[61]

In Southeast Asia, no nation has officially articulated a national stance on LAWS outside of GGE meetings. Indonesia holds a prominent position as a political influencer in Southeast Asia. The country has devoted substantial resources to the modernisation of its weaponry and the production of arms. Indonesia's arms industry mainly consists of government-owned manufacturers that supply weapons for both domestic and international markets. Despite so, while facing internal security challenges, Indonesia has yet to show a clear stance on LAWS despite its capacity for weapon acquisition. Additionally, some countries such as the Philippines also underscore their adherence to IHL in these contexts, while the tech industry in the country has largely remained silent on the topic. Thailand, although lacking an official position, demonstrated interest through inquiries about the use of LAWS in police operations at a regional event in July 2019.[62]

Nonetheless, most ASEAN countries are willing to adopt strategies in dealing with great power competition and utilise them to their advantage in modernising their defences, expanding military capability, and deterrents. ASEAN countries are developing their AI capabilities with assistance from both the United States and China, beginning with digital infrastructure and autonomous equipment as a defence research and development project.[63]

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61 United Nations, *Working Paper to be submitted by the Bolivarian Republic of Venezuela On Behalf Of The Non-Aligned Movement (NAM) and Other States Parties to the Convention on Certain Conventional Weapons (CCW)* (Geneva: Non-Aligned Movement, 2021).

62 Austero et al, *supra* note 59.

63 *Ibid.*

B. European Union

Meanwhile, in the last five years, the EU has shown a significant interest in the development of AI technologies in security. In 2019, member states of the EU stated that the application of AI leads to achieving superior military capabilities both on the physical and virtual battlefield that could be applied both as a threat or as an opportunity.[64] The effort to shape the discussion within the EU reflects a wider and increasing fascination with AI and its possible functions in the military sector. For instance, the financial mechanisms associated with EU-level defence strategies, such as the Permanent Structured Cooperation (PESCO), the European Defence Fund (EDF), and the Common Security and Defence Policy (CSDP), have also been allocated for the advancement of AI capabilities.[65]

However, the European Commission (EC) has made it clear that it excludes military AI from its scope, explicitly stating that it does not encompass the development and application of AI for military uses.[66] The stance adopted by the EC has generated additional inquiries regarding its stance and participation in the AI revolution and its potential implications for military applications.[67] In other words, AI topics have not been widely discussed in the context of the EU's emerging AI policy. On a broader scale, the EU plans to follow the path of GDPR by representing itself as a global standard setter.[68] At the same time Various EU institutions have taken proactive steps

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[64] NATO, *NATO 2022 Strategic Concept* (Madrid: NATO, 2022).

[65] Justinas Lingevicius, "Military Artificial Intelligence as Power: Consideration for European Union Actorness" (2023) 25:1 Ethics and Infomation Technology 19.

[66] European Commission, "White Paper on Artificial Intelligence: A European Approach to Excellence and Trust", (19 February 2020), online: <https://commission.europa.eu/publications/white-paper-artificial-intelligence-european-approach-excellence-and-trust_en>.

[67] Mariarosaria Taddeo & Luciano Floridi, "Regulate Artificial Intelligence to Avert Cyber Arms Race" (2018) Nature 296–298.

[68] Carla Hobbs, *Europe's Digital Sovereignty: From Rulemaker to Superpower in the Age of US-China Rivalry* (London: E European Council on Foreign Relations, 2020).

to support the EU's research and innovation to boost its power across civil and military domains.[69]

On policy tools facilitating the development of technologies like drones, the EU has been supporting these investments and crafting narratives that legitimise their technological effectiveness, considering both economic and security aspects.[70] The progress made in the EU's digital agenda highlights a more explicit connection between technology and geopolitics than previously observed. Consequently, these instances indicate that the topics of security and the influence of technology have been deliberated within the context of their interdependence with policy tools related to defence and shifts in the EU's self-image. This shift appears to be leaning toward a more pro-military stance at the EU level.[71]

Conclusively, the debate surrounding the EU's emerging AI policy has predominantly revolved around the concepts of ethics and trustworthiness as foundations for governing AI. While there are some allusions to the EU's AI policy direction, there's a noticeable absence of in-depth analyses concerning the EU's role in this field. Initial considerations regarding military AI align with broader discussions on the Common Security and Defence Policy (CSDP) and the EU's role as a security actor. Conversations related to CSDP, and the concept of digital sovereignty reveal the multifaceted nature of approaching the issue of military AI, whether through governance, CSDP, norms, or the digital agenda.

VI. MODERNISATION OF WEAPONS IN ASEAN COUNTRIES

A. Indonesia

Within the national normative framework, Indonesia has yet a specific law in place addressing the presence and challenges of AI. To date, there are only

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[69] Raluca Csernatoni, "The EU's Hegemonic Imaginaries: From European Strategic Autonomy in Defence to Technological Sovereignty" (2022) 31:3 European Security 395–414.

[70] *Ibid.*

[71] Linda Monsees & Daniel Lambach, "Digital Sovereignty, Geopolitical Imaginaries, and the Reproduction of European Identity" (2022) 31:3 European Security 377–394.

two laws in place that could address issues related to computer misuse or computer-related acts, Law No.11 of 2008 on Electronic Information and Transactions, and the Personal Data Protection Act.[72] None of these laws are made to govern the general uses of AI.

On a policy basis, however, Indonesia has established The National AI Strategy emphasises leveraging AI for societal benefit, aligning with national interests and ethical responsibilities based on Pancasila.[73] In the G20 2019 commitment and RPJMN IV 2020-2024 agenda, Indonesia underscores responsible AI development in line with Pancasila values, focusing on inclusive growth, sustainable development, human-centric justice, transparency, resilience, security, accountability, economic resilience, regional development, human resource enhancement, cultural development, infrastructure, environmental conservation, and security/public service transformation. Although such a national strategy has set a concrete basis for future AI governance, it does not specifically address such issues within the context of the military.

The modernisation of the Main Armament System (Alutsista) and the development of Indonesia's defence posture are formulated in a strategic plan to meet the Minimum Essential Force (MEF). The MEF was then stipulated in the National Medium-Term Development Plan (RPJMN) for 2010-2014 by Presidential Regulation No. 5 of 2010 and divided into 3 (three) stages. The first stage is 2010-2014, the second stage is 2015-2019 and the third stage is 2020-2024.[74] In quantity, the realisation of the results of defence equipment development in Phase II until 2019, can be measured in three-fold. First, the fulfilment of the Army's defence equipment has reached 76.03% of the total overall target of the Army's MEF development.[75]

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[72] *Law No. 27 Tahun 2022 on the Protection of Personal Data*, 2022.

[73] Sri Saraswati Wisjnu, et al, *Strategi Nasional Kecerdasan Artifisial Indonesia 2020-2045* (Jakarta: Badan Pengkajian dan Penerapan Teknologi, 2020).

[74] Utaryo Santiko & Maria Davina Agustien, "Kerja Sama Industri Pertahanan Indonesia- Perancis dalam Memenuhi Minimum Essential Force Tentara Nasional Indonesia Tahun 2015 - 2019" (2022) 2:1 Moestopo Journal International Relations.

[75] Rizerius Eko Hadisancoko, "Pembangunan Postur Pertahanan Militer yang Diarahkan pada Pembangunan Minimum Essential Force (MEF) TNI Menuju

In addition, the fulfilment of the Navy's defence equipment has reached 69.13% of the total overall target of the Navy's MEF development.[76] Also, the fulfilment of the Air Force defence equipment has reached 45.19% of the total overall target of the Air Force MEF development.[77]

With a mere two-year timeframe remaining to complete the envisioned modernisation of the Indonesian National Armed Forces (TNI), the current administration in Indonesia finds itself in a race against time. The government faces formidable challenges in realising its Minimum Essential Force (MEF) objectives by the conclusion of its current term in 2024, along with the subsequent development of a program to succeed it. As of 2021, the government had accomplished a mere 65 per cent of its MEF objectives, and TNI Commander General Andika Perkasa's estimation aligns with that of other observers, predicting that the MEF will only reach 70 per cent completion by 2024. This sluggish progress in modernisation can be primarily attributed to two significant impediments: financial constraints and political uncertainties.[78]

As delineated in the original strategic planning document for the 2020-2024 period, the Ministry of National Defence was slated to receive a foreign loan allocation of $20.7 billion over these five years. The lion's share of this funding was earmarked for the acquisition of critical foreign-made weaponry systems, essential for fulfilling the MEF targets. Nevertheless, credible sources indicate that the Ministry of Defence has received a disbursement of just $7.8 billion from the Ministry of Finance over the past two years.[79]

Terwujudnya Postur Ideal TNI" *Wira Media Informasi Kementerian Pertahanan* (2019) 12.

[76] *Ibid*.

[77] *Ibid*.

[78] Andi Raihanah Ashar & Muhammad Fauzan Malufti, "Indonesian Military Modernization: A Race Against Time", (23 June 2022), The Diplomat, online: <https://thediplomat.com/2022/06/indonesian-military-modernization-a-race-against-time/>.

[79] *Ibid*.

B. Malaysia

In recent times, there has been a growing chorus advocating for the enhancement of Malaysia's military capabilities, with a particular emphasis on bolstering the navy and air force. In response to these calls, Kuala Lumpur has taken concrete steps to upgrade its armed forces. Notably, Malaysia is set to receive a substantial shipment of over 130 armoured infantry vehicles from Turkey, with an expected delivery date of 2018. Additionally, complementary turrets for these vehicles have been commissioned from South Africa. Furthermore, the Malaysian government has placed an order for 20 armoured infantry fighting vehicles from Thailand, slated for delivery in 2017.

In its pursuit of military modernisation, Malaysia has also made acquisitions from various other nations. This includes the procurement of eight large-calibre mortars from France, the acquisition of more than 200 advanced Ingwe antitank missiles from South Africa, and the purchase of Starstreak surface-to-air missiles from Great Britain. In a significant development in the spring of 2016, the United States facilitated the transfer of 24 M109 A5 self-propelled Howitzers to Malaysia under the Excess Defence Articles (EDA) program.[80]

Simultaneously, the Malaysian Ministry of Defence signed a contract with Malaysian company Deftech for 54 armoured infantry vehicles for delivery by 2020.[81] Several new acquisitions have also been made recently by the Malaysian Air Force. For example, it purchased five PC-7 turbo trainers from Switzerland. Other purchases included 20 Sidewinder guided missiles and six helicopters from the United States.[82] Here, too, shrinking budgets

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[80] Felix Heiduk, *An Arms Race In Southeast Asia?* (Berlin: Stiftung Wissenschaft Und Politik German Institute for International snd Security Affairs, 2017).

[81] Felix K Chang, "Comparative Southeast Asian Military Modernization - 1", (1 October 2014), *The Asan Forum*, online: <https://theasanforum.org/comparative-southeast-asian-military-modernization-1/>.

[82] Felix Heiduk, "An Arms Race in Southeast Asia?", Research Paper, August 2017, Berlin, 13.

have largely prevented the arms modernisation that is indispensable from a military point of view.[83]

Artificial intelligence systems and big data have captured the world's attention, even in the military sector. However, like many other countries, Malaysia needs more comprehensive laws governing various aspects of AI and big data use, including rules regarding AI in defence and security. Currently, governance in this area relies on existing laws and industry codes of conduct as guidelines for best practices, such as the Personal Data Protection Act 2010 (PDPA).[84] Therefore, further regulation is necessary to address the legal issues arising from AI use in Malaysia.

C. Thailand

In 2015, Thailand's defence expenditure stood at $6.1 billion, representing a nearly twofold increase in absolute terms compared to its 2005 budget. During this period, Thailand embarked on a series of substantial military acquisitions and modernisation efforts across its armed forces. In the realm of land forces, Thailand acquired six Israeli-manufactured ATMOS-2000-155mm Howitzers. Additionally, the country made significant procurements from Ukraine, including 121 BTR-3U Guardian Infantry Fighting Vehicles (IFVs), 1,500 anti-tank missiles, and 49 T-84 main battle tanks. Turning to the air force, Thailand expanded its fleet with the acquisition of six EC 145 helicopters from Germany in 2015, followed by an additional five in 2016. In a notable development, Bangkok placed an order for two EC725 helicopters from Airbus, slated for delivery in 2019.[85] Furthermore, Italy facilitated the sale of a P-180 Avanti transport aircraft and eight AW139 helicopters to Thailand. South Korea supplied four T-50 Golden Eagle training aircraft, while the United States contributed three Black Hawk

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[83] Heiduk, *supra* note 80.

[84] Jessie Tan, Liew Sue Yin & Joel Prashant, "Artificial Intelligence - Malaysian Legislative Framework and Key Legal Challenges", *Lexology* (12 May 2023), online: <https://www.lexology.com/library/detail.aspx?g=d9211d03-f7fe-4e5e-a0f4-B73101b6d93c>.

[85] Dominic Perry, "Thailand Grows EC725 Order", Flight Global, online: <https://www.flightglobal.com/thailand-grows-ec725-order-adds-ec645-t2s/114921.article>.

attack helicopters and 50 AIM-120C air-to-air missiles. To enhance its existing F-16 fighter jets, Bangkok invested in state-of-the-art APG-68 radar systems from the United States.[86]

The Thai Navy saw an infusion of capabilities with the addition of two South Korean DW-3000 frigates and a 90-meter BVT-90 long-range patrol boat constructed in the United Kingdom. The boat's 76mm gun was sourced from Britain, its radar from the Netherlands, and the anti-submarine sonar systems for the South Korean frigates from Germany. In a bid to modernize its existing inventory, Bangkok also secured advanced radar systems from Sweden. Of note, the 2017 defence budget reportedly included, for the first time, provisions for the potential acquisition of up to three Chinese submarines.[87]

D. Singapore

In 2015, Singapore allocated a substantial budget of $1.024 billion for its defence expenditure. A significant portion of this consistently high level of military spending was directed toward bolstering its naval capabilities. This included the acquisition of 120 French MICA missiles, intended for installation on eight newly constructed Singapore-built Independence-class corvettes, along with the requisite radar systems. Furthermore, in 2013, Singapore agreed with Germany to procure two Type 218 submarines, with delivery scheduled to commence in 2020. Recent government acquisitions encompass 200 Aster air defence missiles from France, which are destined for integration into the SAMP/T mobile batteries, as well as the procurement of 13 pre-owned battle tanks from Switzerland.[88]

Within the Air Force domain, Singapore's most recent acquisition comprises six A-330 refuelling aircraft of Spanish origin. The country imported 200 AIM-120C air-to-air missiles, two Seahawk helicopters, 20 Sidewinder guided missiles, and 88 cluster-launched GMLRS missiles from the United States. In 2014, Singapore had expressed interest in procuring twelve of the

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[86] Heiduk, *supra* note 80.
[87] *Ibid*.
[88] *Ibid*.

latest F-35B fighter jets from the United States. However, these plans were deferred in August 2016, with the rationale being that the existing aircraft fleet, having expanded with new F-16s and F-15s in recent years. It is sufficient for the nation's air defence requirements at that juncture.[89]

E. Vietnam

In the year 2015, Vietnam allocated a substantial sum of $4.5 billion towards its military expenditures. Notably, within its armed forces, Hanoi made a significant acquisition by procuring 20 mobile Extended Range Artillery (EXTRA) missile systems from Israel. These systems have been strategically designed for the protection of coastal installations and ports, underlining Vietnam's commitment to safeguarding its maritime assets. However, it is in the domains of naval and aerial capabilities that Vietnam has witnessed a notable transformation in its defence dynamics in recent years. In 2013, the Vietnamese Air Force initiated a procurement of twelve state-of-the-art Russian Su-30MK2 combat aircraft, alongside three Spanish C-295 transport aircraft. Yet, the most substantial and debated acquisitions in this period were undertaken by the Vietnamese Navy. Specifically, the acquisition of six Russian Kilo-class submarines, equipped with a formidable array of armaments, including SS-N-27 anti-ship missiles, SS-N-30 cruise missiles, and anti-submarine torpedoes, sparked intense discussions among observers. As of January 2017, all six submarines had been successfully delivered, bolstering Vietnam's underwater defence capabilities.[90] Additionally, the Vietnamese government has announced plans for the development of its domestic defence industry, with a particular focus on naval technology and knowledge transfer, especially in collaboration with Russian companies.

It is worth noting that European arms companies have played a substantial role in the ongoing military build-up within Southeast Asia. Between 2011 and 2015, the five major European arms exporters—namely France, Germany, Italy, Spain, and the United Kingdom—collectively accounted for a noteworthy 21 per cent share of the global arms trade, further highlighting

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89 *Ibid.*
90 *Ibid.*

the international dimensions of regional military enhancements.[91] ASEAN countries are in the process of military modernisation to make their armed forces more effective and capable, as well as to generate military power for strategic deterrence. Except for Singapore, most of the ASEANs are developing countries. Although many countries, such as Thailand, Indonesia, Malaysia, and Vietnam, seek to build self-reliant militaries by developing defence industries, they still rely heavily on major powers to support military modernisation.[92]

VII. ESTABLISHING A REGIONAL REGULATORY FRAMEWORK (RRF) ON AI MILITARY TECHNOLOGY

The development of Lethal Autonomous Weapons Systems (LAWS), also known as Killer Robots, has become a topic of international debate. As demonstrated in Libya, these weapons are not a futuristic concept but a present reality. The precision and effectiveness of LAWS are expected to improve with the advancement of robotics and AI. It is important to note that very small LAWS, capable of carrying poison or tiny explosives that could kill a human, may be impossible to stop. As noted in the 2020 Future of Defence Task Force Report, "it is imperative that policy experts and lawmakers consider the second-and third-order effects of developing and deploying LAWS. Moral, ethical, and legal factors will need to be weighed accordingly."[93]

Understanding the ethical and legal implications of adopting emerging technologies is a crucial concern for democratic nations and multilateral institutions involved in security and defence. The United Nations has been discussing the issue of autonomous weapons for a longer period than the time spent by the countries mentioned here in bridging technical and policy approaches to responsible AI in defence. Certain multilateral institutions are

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[91] Sam Perlo-Freeman, et al, *Trends In World Military Expenditure, 2015* (Stockholm: Stockholm International Peace Research Institute, 2016).

[92] Bunnag, *supra* note 13.

[93] Pablo González Peralta, *The Ethics of Artificial Intelligence and the Multilateral Push for a Treaty*, Master Thesis (Catalunya: Universitat Oberta De Catalunya, 2022).

also crucial for consultations and alignment regarding these matters.[94] ASEAN is a clear actor in this domain.

ASEAN was founded in 1967 by the Bangkok Declaration. Anti-colonial and democratic movements affected its member states and neighbours during the first three decades of ASEAN's existence, resulting in intrastate conflict. ASEAN reaffirmed its commitment to security with the establishment of the Asian Regional Forum and the signing of the Southeast Asia Nuclear Weapon-Free Zone Treaty in 1995.[95] The organisation, which was also severely affected by the East Asian economic crisis of 1997, entered a period of recovery and expansion the following year. ASEAN expanded its engagement in the middle of the twenty-first century by establishing the ASEAN Plus Three and ASEAN Plus Six forums.[96] Southeast Asian states should be concerned about the risks associated with the proliferation of autonomous weapons, given that their region is home to likely early adopters and innovative non-state armed groups. Adding increasingly autonomous platforms to this environment without widely accepted deployment standards could exacerbate regional instability.

Given the rapid development of artificial intelligence (AI) arms technology by countries in the Indo-Pacific, it is optimal for ASEAN, as the heart of the Indo-Pacific, to formulate a regional regulatory framework (RRF) about AI arms technology. The RRF is intended not only to prevent impacts caused by non-ASEAN member countries in ASEAN but also to prevent ASEAN countries from abusing AWS and to prevent bilateral cooperation between ASEAN countries and non-ASEAN members related to AWS, which has the potential to endanger regional peace and security.[97] The Southeast Asia Nuclear Weapon-Free Zone Treaty of 1995 was a golden page in ASEAN's history because it was successful in preventing the

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[94] Zoe Stanley-Lockman, *Responsible And Ethical Military AI: Allies and Allied Perspectives*, Issue Brief (USA: Center for Security and Emerging Technology, 2021).

[95] Heru Prayitno, "AUKUS and the Role of ASEAN Centrality in Managing Regional Security Affairs" (2021) 26 Technium Social Sciences Journal.

[96] *Ibid*.

[97] Sachin Chitturu, et al, *Artificial Intelligence And Southeast Asia's Future*, Discussion Paper (Singapore: Mckinsey Global Institute, 2017).

development of nuclear weapons in Southeast Asia. This can be repeated in the formation of the ASEAN RRF for AWS.[98]

In this instance, the AWS RRF can observe the European Union's and North Atlantic Treaty Organisation (NATO) success in drafting an RRF about the development, deployment, and use of AI systems. In 2020, within the framework of the multinational Capability Development Campaign (MCDC), NATO initiated the Military Uses of Artificial Intelligence, Automation, and Robotics (MUAAR) project.[99] This project aims to tackle the challenges associated with conducting collaborative coalition operations and to deliver evaluations on such endeavours. Similarly, the legal framework established by both organisations succeeds in drafting an RRF about the development, deployment, and use of AI systems, which must be based on the principles of respect for human autonomy, prevention of harm, fairness, and explicability. These four principles can be adapted to the long-held values of the Association of Southeast Asian Nations (ASEAN). In addition, when drafting the AWS RRF in ASEAN, clear boundaries should be established to prevent multiple interpretations and abuse-prone legal loopholes. The formation of the AWS RRF in ASEAN, will fill the international legal void regarding AWS regulation and provide legal certainty regarding the definition of AWS.[100] Hence, the development of military technology or military modernisation can continue while justice and legal certainty are simultaneously upheld.

VIII. CONCLUSION

The rapid advancement of AI and Autonomous Weapon Systems (AWS) poses a significant challenge to international humanitarian law. The Indo-Pacific nations, including the United States, China, Australia, Japan, and India, are racing to use AI in the military, raising concerns about a potential

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[98] Prayitno, *supra* note 95.

[99] István Szabadföldi, "Artificial Intelligence in Military Application – Opportunities and Challenges" (2021) 26:2 Land Forces Academy Review 157–165.

[100] Chitturu et al, *supra* note 97.

arms race, particularly in Southeast Asia. The absence of a binding international agreement exacerbates these concerns.

AI's integration into military operations could reduce human involvement, potentially violating core humanitarian principles like humanity, distinction, and proportionality. Ensuring AI deployment aligns with these principles is crucial to avoid unintended harm. Ultimately, there's a pressing need for a regional regulatory framework in Southeast Asia to govern AI's military use, mitigating risks associated with the AI arms race while upholding humanitarian values. Cooperation, both internationally and regionally, is vital in shaping AI's role in warfare to safeguard global security and humanitarian principles amidst rapid AI advancements.

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COMPETING INTEREST

The authors declare no competing interests.

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