

Lethal Autonomous Weapons System:

A PRIMER FOR INDONESIAN
POLICY AND RESEARCH

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Table Of Acronyms

<i>Alutsista</i>	Primary Defense Weaponry Systems <i>(Alat Utama dan Sistem Persenjataan)</i>
CCW	Convention on the Certain Conventional Weapons
CSO	Civil Society Organization
GGE	Group of Governmental Experts
IHL	International Humanitarian Law
NGO	Non-governmental Organization
LAWS	Lethal Autonomous Weapons System
<i>Permenhan</i>	Ministerial Decree of the Minister of Defense
<i>Perpres</i>	Presidential Decree
PUNA	Unmanned Aerial Vehicle <i>(Pesawat Udara Nirawak)</i>
PWDS	Primary Weaponry Defense Systems
<i>Siskanhamrata</i>	Universal Defense and Security System <i>(Sistem Pertahanan dan Keamanan Rakyat Semesta)</i>
UN	United Nations
UU	Law <i>(Undang-Undang)</i>
UUD	Constitution <i>(Undang-Undang Dasar)</i>

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Preface

The rapid development of modern technology has brought an increasing significance of its impact and influence on human lives. The exploration and acceleration of Artificial Intelligence (AI) technology have now reached a stage where it can replace humans' daily functions, including defense and security systems. On the pretext of easing and increasing the efficiency of defense and security systems, a weapons system previously inseparable from the control, intelligence, and wisdom of human beings has now entered a new round where robots are programmed to replace subjects in performing such functions.

Currently, observed from its level of autonomy, there are three classifications of weapons systems: (1) Semi-Autonomous Weapons System; (2) Supervised Autonomous Weapons System; and (3) Lethal Autonomous Weapons System (abbreviated as LAWS). Except for Lethal Autonomous Weapons System, the two other weapons systems still involve human control in their operations. Meanwhile, based on the predominantly accepted definition, LAWS can select its target based on programmed algorithms and subsequently take independent decisions upon the said target. With such capability, the existence of LAWS and its development have consistently become a global debate.

This reference briefly yet comprehensively covers the details of LAWS by specifically including the perspective of Indonesia on the issue to capture a closer image of the country's experience and conditions. We begin with an overview of LAWS, including its technology and working mechanism. In the second part, we provide the debate on LAWS within the global context. In the last part, we will observe LAWS through the Indonesian perspective and its civil society. This reference aims to support the mainstreaming of discussion and research on LAWS and become a basic guideline for policymakers in the country, particularly on defense and security policies.

The Basics of Lethal Autonomous Weapons System

What is Lethal Autonomous Weapons System (LAWS)?

In general, Lethal Autonomous Weapons System (LAWS) refers to a weapons system that can operate autonomously to search for and engage a target without human intervention.

LAWS is defined differently by various parties. The United States defines LAWS as "a weapon, once activated, can select and engage targets without further intervention by a human operator".¹ The United Kingdom understands LAWS as "capable of understanding higher-level intent and direction...[i]t is capable of deciding a course of action, from several alternatives, without depending on human oversight and control".² Meanwhile, China classifies LAWS as a weapons system that fulfils five aspects: (1) lethality; (2) absence of human intervention and control during the entire process of executing a task; (3) impossibility for termination once activated; (4) indiscriminate effect; and (5) through interaction with the environment, the device can learn autonomously.³

Campaign to Stop Killer Robots, a global coalition of Non-governmental Organizations (NGO) campaigning for the ban on LAWS, considers LAWS a weapons system that selects and engages targets based on sensory inputs instead of human inputs.⁴ Following this definition, according to Reaching Critical Will, LAWS is a weapons system that operates without meaningful human control, rendering the weapons system capable of deciding on where and how it is used; what or

¹ US Department of Defense. "Directive number 3000.09." *US Department of Defense*, 2012.

² UK Ministry of Defence. "Joint Doctrine Note 2/11: The UK Approach to Unmanned Aircraft Systems." ed. *UK Ministry of Defence*, 2011.

³ Delegation of People's Republic of China to CCW. "Position Paper," *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*, 2018.

⁴ Campaign to Stop Killer Robots. "The Problem." *Campaign to Stop Killer Robots*.
<https://www.stopkillerrobots.org/learn/#problem>. Accessed on January 1, 2021.

whom it is used against; and the impacts of its use.⁵

Based on the above definitions, it can be concluded that **LAWS is a weapons system equipped with technology and artificial intelligence, enabling it to possess independent abilities in analyzing its environment to select a target and take active decisions to engage said target without human supervision or intervention.**⁶ These characteristics are the very cause behind the pro and contra on the existence of LAWS.

How Autonomous is LAWS?

To capture a clearer image of the autonomous aspects of LAWS, we shall first understand the levels of autonomy in a weapons system. In this context, several weapons systems also possess a certain level of autonomy despite them not being classified as LAWS. For instance, remote-controlled weapons systems such as unmanned aircraft also include autonomous functions for landing, take off, navigation, and several other aspects in target acquisition.

Generally, there are three levels of autonomy in a weapons system, starting from the lowest level:⁷

1. Semi-Autonomous Weapons System, or referred to as human-in-the-loop, is a weapons system, once activated, only engages an individual target or specific target groups pre-selected by a human operator.
2. Supervised Autonomous Weapons, or referred to as human-on-the-loop, is a weapons system designed to allow human operators to intervene and abort attacks to prevent more extensive harm, including weapon malfunctioning.
3. Autonomous Weapons, or referred to as human-out-of-the-loop, is a weapons system, once activated, selects and engages a target without intervention by a human operator.

Based on the above elaboration, it can be seen that autonomous weapons can be classified based on their ability to adapt and take action according to their present external environment. Therefore, autonomous weapons in the form of LAWS will be able to take action independently

⁵ Acheson, Ray. "A WILPF Guide to Killer Robots." *Reaching Critical Will*, 2019.

⁶ Wyatt, Austin dan Galliot, Jai. "Closing the Capability Gap: ASEAN Military Modernization during the Dawn of Autonomous Weapon Systems." *Asian Security* 16, no. 1, 26 September 2018, pp. 53–72.

⁷ ICRC. "Autonomous Weapon Systems: Technical, Military, Legal, and Humanitarian Aspects." *International Committee of the Red Cross*, 2014, p.16.

according to their surrounding environment. However, this does not mean that LAWS possesses the ability to completely think in an independent manner as its pre-designed software algorithms will always limit its operations. Furthermore, the level of autonomy of a weapons system is also determined by its basic scope of functions.⁸

In specific, a weapons system is acknowledged as autonomous when said weapons system can conduct its primary functions without human operator intervention. These primary functions include target acquisition, tracking, and engagement by a weapons system. Based on that, a weapons system that still enables human operator control in those functions cannot be referred to as LAWS, although it might have achieved autonomy in other functions.

Technology supporting LAWS development

As an autonomous tool, the development of LAWS is inseparable from four fundamental technologies:

1. Sensing technology which enables a system to collect data of its surrounding environment;
2. Hardware and software technology which functions to interpret collected data from sensory into decision and action plan;
3. Communication technology to connect a system with other agents, including both machines and humans;
4. Actuator technology to support the execution of an action by a system within its operational environment.⁹

We can see the combination of those four technologies in the form of an unmanned aircraft.

⁸ ICRC, 2014, p.62.

⁹ Boulanin, Vincent and Verbruggen, Maaïke. "Mapping the Development of Autonomy in Weapon Systems." *Stockholm International Peace Research Institute*, 2017, p.12.

Since the beginning of its development in the 90s, unmanned aerial vehicle (UAV) has combined sensory technology, chip processing, computer software, and communication technology to carry out its tasks.¹⁰ Even so, unmanned combat aerial vehicles still require human intervention for their operation.

The development towards a completely autonomous weapons system could only take place along with technological development in software. This is due to the role software aspects play in determining the system's 'thinking' speed and the amount of data that can be processed. With advanced software, a weapons system can carry out sensing, remodelling its surrounding environment, and complex decision making.

In this case, artificial intelligence and machine learning represent software technology advancement to be used in LAWS operations.¹²

As a technology, artificial intelligence allows LAWS to conduct identification and take instant tactical action based on algorithms created from previous machine learnings. Based on these capabilities, intervention or control by a human operator in a weapons system operation can be eliminated, rendering LAWS a fully autonomous system.

Current development of LAWS in the world

Although LAWS only seems to be a new technology of the future, autonomy in weapons systems has fundamentally been developed and operated by several countries. There are notably six countries with the capability to develop LAWS: China, Israel, Russia, South Korea, United Kingdom, and the United States.¹³ Aside from those countries, Australia, Turkey, and several other countries are also developing LAWS.

¹⁰ McCormick, Ty. "Lethal Autonomy: A Short History." Foreign Policy, <https://foreignpolicy.com/2014/01/24/lethal-autonomy-a-short-history/>. Accessed on 01 January 2021.

¹¹ Vincent Boulanin and Maaïke Verbruggen, p.12.

¹² Pedron, Stephanie Mae dan da Cruz, Jose de Arimateia (2020) "The Future of Wars: Artificial Intelligence (AI) and Lethal Autonomous Weapon Systems (LAWS)," International Journal of Security Studies: Vol. 2: Iss. 1, Article 2.

¹³ HRW. "Stopping Killer Robots: Country Positions on Banning Fully Autonomous Weapons and Retaining Human Control." *Human Rights Watch*, 2020, p.3.

In general, there are three types of weapons systems with autonomous abilities in several aspects:¹⁴

1. **Aerial Weapons System**, that is specifically designed to reduce or eliminate the effectiveness of adversary aerial attack. Autonomy in this weapons system can be seen in its targeting aspect, which aims to detect, trace, differentiate, and engage an aerial threat quickly and accurately. This weapons system can be operationalized in the mode of human-in-the-loop or human-on-the-loop. Some examples of this weapons system are the Russian S-400 and US Aegis Combat System.
2. **Robotic Guidance System**, a weapons system that can automatically detect, track and engage a target. Robotic guidance system is also referred to as an armed surveillance system as it is operationalized to monitor the perimeter of a protected area from adversary threats. On paper, the robotic guidance system can be operationalized through human-out-of-the-loop mode, although human-on-the-loop is also operated in practice. Some examples of this weapons system are SGR-A1 and South Korea's Super aEgis II.
3. **Suicide Drone**, that is a combination of two weapons systems: guided missile and unmanned aircraft. A suicide drone is able to surround a territory for an extended period while identifying and engaging a reached target by taking off and exploding itself towards the target. The operation of suicide drones can be done autonomously after take-off, although operation on human-on-the-loop mode is also possible. Examples of this weapons system are Harop, Harpy, and Israel's Orbiter 1K "Kingfisher".

¹⁴ Boulanin, Vincent and Verbruggen, Maaïke, p.36..

Lethal Autonomous Weapons System in the Global Debate

The issue of LAWS has caused a debate between those who support this weapons system's existence and development and those who think otherwise. This debate has led to a prolonged discussion on the possible legal instruments to regulate LAWS that are agreeable to all state actors.

Arguments for LAWS

The support for LAWS development generally stems from two interests, the effectiveness and the efficiency of modern military technology. LAWS can assist military operations in areas deemed to be "challenging" during a range of contemporary modern wars, such as urban settlements, forests, and terrains beyond humans' average reach. For states like the United States and Russia, which are often involved in conflicts outside of their sovereign territory, the urgency to develop LAWS is amplified.

Theoretically, LAWS is also believed to be more capable of differentiating combatants and civilians as targets. The advancement of this weapons technology can reduce human error occurrences among human soldiers, such as mistaken shots and extreme violence due to war stress. The conditions faced by human soldiers in a "dull, dirty, or dangerous mission" become the pretext for several states to consider LAWS as a necessity.¹⁵

In line with the grounds on which LAWS was developed during the Cold War between the United States and the Soviet Union, LAWS is also believed to be the state's solution to reduce the budget on soldiers' annual logistics spending, particularly for military operations in distant locations. On the other side, this can consequently heighten the possibility of a state waging war due to the reduced costs and spending.

¹⁵ Marchant, Gary E. et al. "International Governance of Autonomous Military Robots," *Columbia Science and Technology Law Review* 12 (June 2011): 272–276.

Arguments against LAWS

LAWS through the lens of International Humanitarian Law

The characteristics and potential destructive impacts caused by the operation of LAWS are not aligned with the principles of international humanitarian law.

LAWS potentially violates the principle of distinction in international humanitarian law, that is, the responsibility to differentiate between civilians and combatants and between civil objects and the military when launching an attack in wars.

This may occur due to the fact that LAWS is only programmed to function based on pre-entered algorithms by its developers, oftentimes failing to operate in complex and unpredictable situations.¹⁶ Aside from that, in the current era of modern warfare, not all combatants identify themselves clearly by wearing uniforms. Consequently, in specific cases, identification based on human behavior and emotions becomes the only method to identify a person as either a combatant or civilian. Indubitably, it is tremendously difficult for a robot to identify human behavior and emotions as it requires highly complex programming for the system to operate in the manner a human being.¹⁷ This raises a question on the ability of LAWS to identify combatants or civilians precisely.

Not only violating the principle of distinction, the functions of LAWS that often cause large-scale damage also count as a violation of the principles of proportionality and precaution. The proportionality principle primarily sets forth responsibility to ensure that attacks launched do not cause civilian deaths and unnecessary civilian object damages (superfluous injury and unnecessary suffering). Based on those two principles, the appraisal of a war situation before setting an attack is **required** to avoid unnecessary deaths and damages; this is where the precaution principle works. Such an assessment, which often occurs under challenging situations, depends highly on human evaluation. In essence, IHL sees LAWS as highly dangerous weapons to be operated in wars.

¹⁶ Human Rights Watch. "Heed the Call," *HRW*, 21 Agustus 2018, <https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots>.

¹⁷ Asif Khan, Muhammad A.H.S.J Jillani, dan Maseehullah. "Killer Robots and Their Compliance with the Principles of Law of War." *Journal of Law and Society* 1, no. 75 (July 2019): 55-72.

Until today, it is questionable how this weapon, whose choice of actions relies on programming algorithms, can conduct an evaluation based on the principle of proportionality and follow precautions to avoid unnecessary deaths and damages in war situations.¹⁸

Moral and Humanitarian Issues in LAWS

Not only is the weapon considered to be illegal based on IHL, but the operation of LAWS in warfare also contributes to the emergence of **more profound moral and humanitarian consequences**. The death of human beings caused by a machine that depends on programming algorithms fundamentally degrades human dignity. Instead of considering a human being as a living and valuable subject, LAWS only sees a human being as a mere object and war target.

“ *Machines with the power and discretion to take lives without human involvement are politically unacceptable and morally repugnant.* ”

*Secretary-General of the UN, Antonio Guterres
in Paris Peace Forum 2019*

The operation of LAWS as a weapon of warfare also **reduces the aspects of pity and empathy**, which are only undergone by humans when making a decision in wars. The loss of such humane aspects can hinder the mission to minimize the number of causality in wars. LAWS do not possess the capability to question the very program that directs it to destroy a school with a number of civilians inside – contrasting with soldiers who can consider those elements before launching an attack. LAWS only works based on its programming, even if it means sacrificing innocent human lives.

¹⁸ Asif Khan, Muhammad A.H.S.J Jillani, dan Maseehullah. "Killer Robots and Their Compliance with the Principles of Law of War." *Journal of Law and Society* 1, no. 75 (July 2019): 55-72.

Accountability and Responsibility Issues in LAWS

An essential issue in the operation of LAWS is the question of which party is responsible for the death of a person and civilian object damages as consequences of LAWS operation.

Until this point, it is still questionable who can be held responsible for accidents and mistakes in attack launches – is it the program that designed the algorithms in LAWS? Is it the factory that produced and developed the tools? Is it the war general who commanded the use of LAWS?

It will be **difficult to delegate responsibility and legal consequences to a machine that is a dead being. This becomes an essential issue as it becomes challenging to uphold justice**, particularly for the victims.

Gender Issues in LAWS

LAWS attempt to conduct profiling based on pre-programmed algorithms presents a disadvantageous risk as observed through the lens of gender. Face recognition technology, known to be ridden with gender and identity bias, often identifies targets mistakenly, especially women, colored groups, and the disabled. On top of that, LAWS' method to identify targets according to its programming is usually based on their appearances of "military-aged males"). The assumption that men are always identical with active combatants can lead to gender-based violence and cause more civilian casualties. The programming of its profiling method based on such gender stereotypes renders LAWS extremely dangerous, considering that women often play a role as combatants in warfare. Other than that, LAWS is also unable to protect women from gender-based violence, such as sexual violence, which often occurs in conflict situations.

LAWS and international security threats

The convenience offered by LAWS on reducing the costs and death risks of dispatching soldiers may further **encourage states to consider the prospects of war**. The United States, Russia,

China, Israel, South Korea, and England are currently developing LAWS as an alternative weapon for warfare usage. Aside from that, the development of LAWS among these dominant states in international politics raises concerns among the international public of an accelerated arms race. The consequence of this development is an increased international political tension.

Allowing the proliferation of LAWS and its development may also **lead to the emergence of trading and smuggling practices** of raw materials, AI technology, software, and even the finished product of LAWS itself. It would be gravely dangerous if LAWS becomes accessible to parties without ownership and operation permits, including criminal organizations. This can inevitably trigger new conflicts or exacerbate existing ones.

Debate on LAWS in the regional and global level

Acknowledging the dilemmatic existence of LAWS, discussion on this weapon has been conducted both at the global and regional levels. In 2013, through Human Rights Council on Lethal Autonomous Weapons, the UN brought up the issue of LAWS for the first time in front of its member countries. The discourse was not only brought up in the UN General Assembly and but also the other UN bodies such as the Group of Governmental Experts, OHCHR, and UNHCR, which have actively discussed and declared its rejection of LAWS since 2013.

At the regional level, the European Union has actively discussed the issue of LAWS within the European Parliament and released its first resolution on the ban of LAWS in 2014. On top of that, the African Union and other African countries have begun discussions on regional cooperation regarding the issue of LAWS since 2018.

The debate of LAWS is generally divided in two. First, among parties who champion the full ban on LAWS. Second, those who perceive the limitation on LAWS as too early. Until now, there has not been any technology that enables weapons to operate autonomously. This provides a ground to the rationale that the ban on LAWS is still too early, as observed through the lens of existing international laws.¹⁹ Until today, there are more than 30 countries that officially support the total ban on LAWS. CSOs and NGOs focusing on human rights are the first and foremost parties who raised the issue of LAWS globally. One of the most influential movements is the Campaign to Stop Killer Robot initiated by Human Rights Watch in 2013. The campaign that has gathered more than 60 NGOs worldwide is voicing out the total ban on LAWS.

Aside from those who support the total ban on LAWS, several countries are only banning LAWS within certain boundaries. For instance, China actively develops LAWS while rejecting its operation in war fields. Even when LAWS eventually becomes banned, there has yet to be agreements on which aspects of the weapon should be restricted. The debate on LAWS in European Union

is also showing such signs of contradiction. Although the European Union supports the ban on LAWS through the 2018 European Parliament Resolution, several parties express that the technological development behind LAWS is way too advanced to be halted simultaneously. For that reason, regulation is considered to be the most feasible option to address LAWS.²⁰

Albeit so, the majority can agree that the need for an effective human control is an aspect agreeable to all parties. This was delivered during the meetings of the Convention of Certain Conventional Weapons throughout 2014-2019. However, the United States and Russia rebutted this agreement by arguing that "effective human control" is a subjective definition without a clear line. On the same tone, 125 member countries of the Non-Aligned Movement, including Indonesia, asserted the importance of regulations on the use and development of LAWS. Other consensuses have also been reached on how LAWS should not violate existing rules on war, such as the Law of Armed Conflict, which highly upholds the principles of proportionality and the separation between civilians and combatants.

In general, most states agree that there needs to be an international legal instrument to regulate this weapon.

The next debate lies on the question of which instrument will eventually regulate LAWS. A coalition by Austria, Brazil, and Chile proposed the ban on LAWS through the Convention on Certain Conventional Weapons (CCW) framework, an international law that bans the use of weapons such as blinding lasers, landmines, and other weapons. However, several states with high military capability, particularly the United States and Russia, rejected the proposal by arguing that the new CCW protocol to regulate LAWS is way too 'premature'. The two states consider the existing international laws as sufficient to regulate LAWS if the weapon were to be used.

Since 2013, various civil society groups have expressed their support for the total ban on LAWS. Not only coming from human rights activists, 270 scholars from 37 countries who took a serious

¹⁹ Noone, Gregory P. and Noone, Diana C. The Debate Over Autonomous Weapons Systems. *Case Western Reserve Journal of International Law*, 47(1), 2015, p. 26.

²⁰ Brzozowski, Alexandra. "No progress in UN talks on regulating lethal autonomous weapons." *EURACTIV*, 22 November 2019. <https://www.euractiv.com/section/global-europe/news/no-progress-in-un-talks-on-regulating-lethal-autonomous-weapons/>.

measure to warn the risks of LAWS development rebutted the claim that the weapon can be operated in detail without violating existing ethical principles and humanitarian laws. Religious groups also express a similar sentiment due to the aspects of morality and human dignity violated by LAWS. In 2014, a coalition of 160 religious figures from Islamic, Christian, Hindu, and Jewish groups declared their support for the ban on LAWS.²¹

²¹ Human Rights Watch. "Heed the Call A Moral and Legal Imperative to Ban Killer Robots." *HRW*. 21 August 2018. <https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots>.

Lethal Autonomous Weapons System and Indonesia

The impacts of LAWS development on Indonesia

Indonesia's geographical position bordering a number of states causes the country to be more prone to be involved in regional and border conflicts while also being taken advantage of as a post for transnational criminal activities. Indonesian government's tendency to encourage weapons technology development, including automation technology, is also based on acknowledging such strategic threats. Aside from external threats, Indonesia's internal security is also notably unstable, with cyber threats, religious and ethnic conflicts, separatism, extremist groups, and terrorism spread across several points in Indonesia's extensive territory.

Without strict and comprehensive regulations for the development of LAWS, those conflicts can be more prone to escalate due to the easier access to acquiring these raw materials, software, and weapons system technology – both legally and illegally – by whomever, including organized transnational crime groups and terrorists. The convenience provided by LAWS operation – such as cutting back budgets for combatant training and logistics, reducing casualty risks for operating parties, the ability to operate the tool discreetly from a long distance, and the difficulties of deciding on the accountability of the attacker – indeed turn this system into an appealing choice for criminal groups. Once these criminal groups gain access to LAWS, their adherence to humanitarian principles and ethics becomes increasingly unable to be accounted for. This may pose a serious threat not only to the security of Indonesian citizens but also to the country's surrounding territories.

AI-based technology and computation are also more prone to be hacked and misused by irresponsible parties. Even though Indonesia already employs a set of regulations on cybersecurity and defense, one of the main characteristics of the cyber world is the presence of numerous blind spots as possible loopholes for criminal acts.

The development of LAWS also excludes discourse on its impacts on environmental sustainability. The non-discriminative and nonproportional nature of LAWS would impact not only human beings but also other kinds of biotics in Indonesia.

Regulations on LAWS in Indonesia

Indonesia does not have a direct and specific legal instrument to regulate LAWS. However, several legal frameworks regulate Indonesia's fundamental attitude towards defense and weaponry policy as well as the possible risks posed by systems like LAWS, such as:

Third Alinea of the Preamble of Indonesia's 1945 Constitution (UUD)

"Pursuant to which, in order to form a Government of the State of Indonesia that shall protect the whole people of Indonesia and the entire homeland of Indonesia, and in order to advance general prosperity, to develop the nation's intellectual life, and to contribute to the implementation of a world order based on freedom, lasting peace and social justice, Indonesia's National Independence shall be laid down in a Constitution of the State of Indonesia, which is to be established as the State of the Republic of Indonesia with the sovereignty of the people and based on the belief in the One and Only God, on just and civilized humanity, on the unity of Indonesia and on a democratic rule that is guided by the strength of wisdom resulting from deliberation/representation, so as to realize social justice for all the people of Indonesia."

Law (UU) No. 3 of 2002 on State Defense

In general, Law No. 3 of 2002 on State Defense regulates the basis, principles, direction, functions, and scope of Indonesia's defense. The third article specifically elaborates on the principles of Indonesia's national defense.

Article 3

1. State defense is organized according to the principles of democracy, human rights, general welfare, living environment, national law regulations, international law and custom, as well as the principle to live side by side in peace.
2. State defense is organized based on the consideration of Indonesia's geographical conditions as an archipelago.

Law (UU) No. 16 of 2012 on Defense Industries

This set of laws regulate the direction, functions, and scope of Indonesia's defense industries.

Article 2

The enforcement of defense industries is conducted based on 15 principles, some of which include: (1) effectivity and justice; (2) accuracy; and (3) appropriateness.

Article 29

Regulates the components of research, development, and mandatory simulation conducted to cultivate knowledge and technology in supporting defense industries to become independent and responsive towards defense and security technology development.

Chapter VII Limitations

Chapter VII Limitations, which consists of Article 66 – 69, regulates limitations on each individual from leaking information regarding the formulation of technology design, selling, exporting, and transferring strategic Defense and Security Equipment (without the Ministry of Defense's permission).

Presidential Decree (Perpres) of the Republic of Indonesia No. 8 of 2021 on General Policy of State Defense 2020-2024

This presidential decree serves as a guide for the manufacture and maintenance of the Indonesian defense policy for the period of 2020-2024. The primary principle and mission behind it is the protection and the cultivation of a sense of security for every Indonesian citizen through the manifestation of a Universal Defense and Security System (Sistem Pertahanan dan Keamanan Rakyat Semesta, abbreviated as *Siskanhamrata*) with characteristics encompassing the people, the universe and the territory. It is also mentioned that the characteristic of Indonesia's strategic defense posture is active defensive, focusing on the optimization of defense capacity in the big islands and strategic straits.

Siskanhamrata also emphasizes capacity building and modern technological innovation to support state defense acts. Specifically, section a. Primary general policy of military defense,

article e) state defense technology and industry development policy stipulates that the referred modern weapons technology includes artificial intelligence, automatic systems, machine learning, and robotic technology.

Emergency Law (UU Darurat) of the Republic of Indonesia No. 12 of 1951 on Modifying “Ordonnantie Tijdelijke Bijzondere Strafbepalingen” (Stbl. 1948 No. 17) and The Old Law of the Republic of Indonesia No. 8 of 1948

This Emergency Law regulates the strict legal consequences (criminal law) for every individual who owns, transports, hides, operates, imports, and exports all types of firearms, munitions, and explosives to/from Indonesia. While it does not specifically refer to LAWS, the aforementioned weaponry components can be found in this weapons system.

Ministerial Decree of the Minister of Defense (Permenhan) No. 82 of 2014 on Guidelines on Cyber Defense

This Ministerial Decree is a basic guideline to enforce cyber defense (planning, construction, enforcement, and evaluation) for the Ministry of Defense and the Indonesian National Army. Cyber defense is aimed to protect the state from cyber threats and attacks which pose a danger to the security of state secrets, classified information, software, hardware, and other vital and non-vital Indonesian objects. Such cyber threats and interruptions may come from various sources, including extremist organizations, hacktivists, and organized crime groups.

Indonesian Government's Attitude towards the Issue of LAWS

In general, **the Indonesian government has not shown an assertive and consistent attitude towards the development of LAWS**, both at the national and the global level. During a meeting of the Human Rights Council in 2013, the Indonesian government expressed its concern about the existence of LAWS as observed from both its legal and humanitarian aspects.

“[T]he most notable impacts on social values, including... the protection and the value of life and international stability and security.”

During the UN General Assembly on 9 October 2019, Indonesia represented the Non-Aligned Movement to declare the urgency of a binding legal instrument on LAWS. Despite having stated such a declaration, **Indonesia did not participate in CCW and has never attended a**

GGE meeting that has specifically discussed LAWS regulation since the group's establishment in 2014 until now.²²

Projections of the Future of LAWS in Indonesia

Until the end of 2019, Indonesia has developed several types of locally produced drones (unmanned aircraft), although none can be classified as LAWS yet as they have not been equipped with weapons systems. The development of drones or PUNA (Pesawat Udara Nirawak, translates to Aerial Unmanned Aircraft) in Indonesia is projected to fulfill its primary function as border surveillance and reconnaissance vehicle. To facilitate this function, the Indonesian government, through the Agency for the Assessment and Application of Technology (*Badan Pengkajian dan Penerapan Teknologi*, abbreviated as BPPT), has produced several types of PUNA such as PUNA Sriti, PUNA Alap Alap, and PUNA Wulung).

On 30 December 2019, Indonesia introduced PUNA MALE (Medium Altitude, Long Endurance) Elang Hitam. Although it is still unable to operate fully, Elang Hitam is designed as the first Indonesian unmanned aircraft with the ability to carry weapons systems.

While the country plans to produce and operate PUNA MALE, Indonesia is still considered to be far from developing LAWS due to several factors, including:

1. The operations of PUNA Indonesia still rely on the "human-in-the-loop" mode, rendering it not fully autonomous.
2. The priority of Indonesia's drone operation is border surveillance and reconnaissance vehicle.
3. Technology lag compared to other countries which have operated drone equipped with an autonomous weapon.²³

On the other hand, it should be put under attention that President Joko Widodo, during a meeting with the Indonesian National Army, Indonesian National Police, and the Ministry of Defense on 23 January 2020, indicated his interests in developing LAWS as a part of Indonesia's weapons system based on the following remark:

²² Human Rights Watch. "Stopping Killer Robots. Country Positions on Banning Fully Autonomous Weapons and Retaining Human Control." *Human Rights Watch*, 2020, <https://www.hrw.org/report/2020/08/10/stopping-killer-robots/country-positions-banning-fully-autonomous-weapons-and>. Accessed 29 January 2021.

²³ Naynar, Muhammad dan Paradipta, Arya. Wawancara. Dilakukan oleh Raditya Bomantara, 20 Januari 2020.

"We shall strengthen our defense system, starting with automation technology accompanied by the development of autonomous weapons system. Once again, automation technology accompanied with the development of autonomous weapons system. A forward-looking rapid development."²⁴

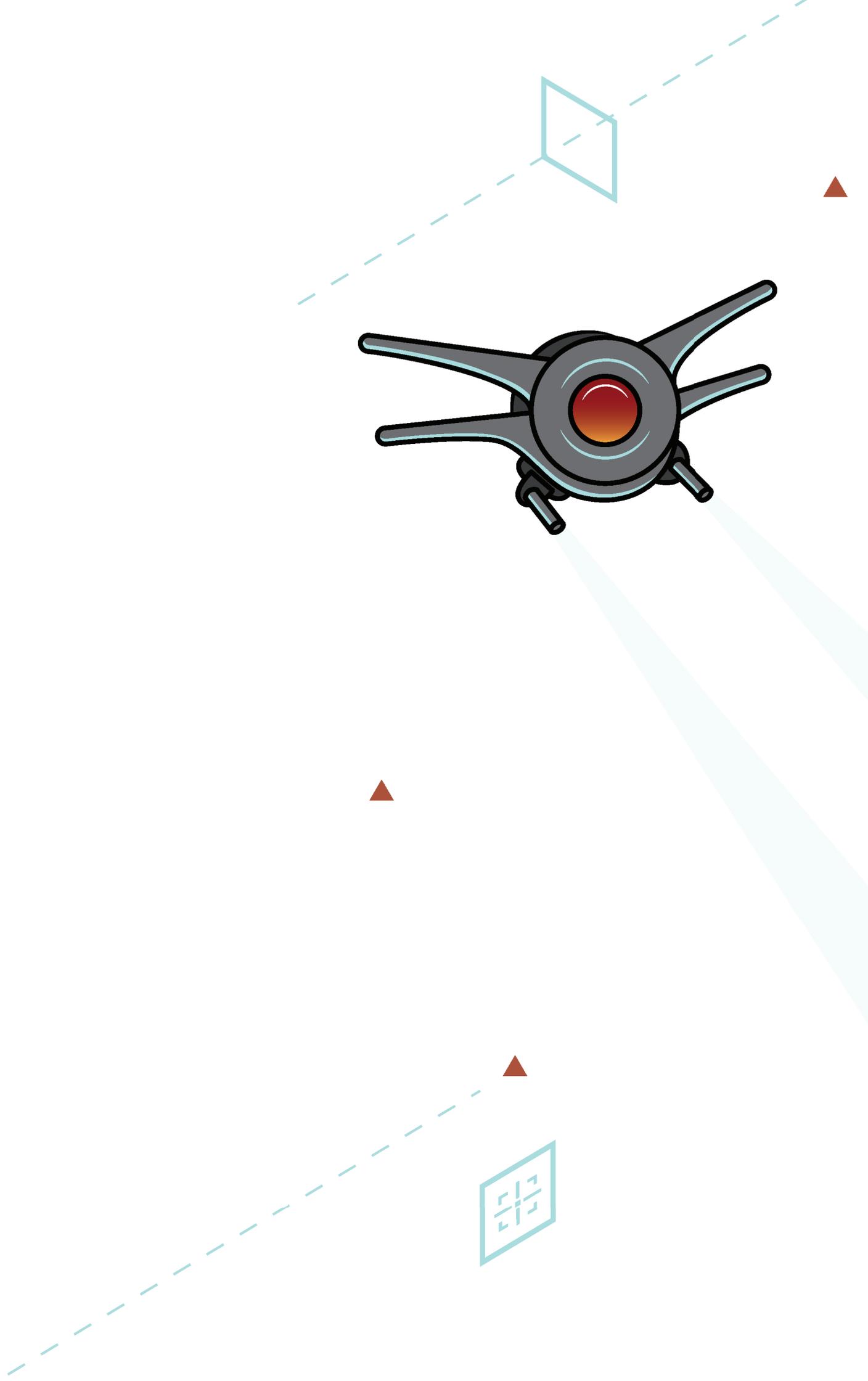
President Joko Widodo's remarks are also reflected on the Presidential Decree No. 8 of 2021 on General Policy of State Defense 2020-2024 in section a. Primary general policy of military defense, article e) state defense technology and industry development policy, where it clearly elaborates the Indonesian government's intention to modernize weapons systems in Indonesia to support Indonesia's defense acts, including taking advantage of artificial intelligence technology, automation systems, machine learning, and robotic technology.

Without a comprehensive risk assessment to accompany this weaponry modernizing efforts, added by Indonesia's unwillingness to be involved in international negotiations regarding the regulation of LAWS, the direction and projection of such a dangerous weapons systems development in Indonesia would only seem to raise concerns.

Indonesian Civil Society on LAWS

The discourse on LAWS has yet to gain attention from Indonesian civil society. Outside of the parties directly involved in the policymaking on weapons, discussions on modern Alutsista (Alat Utama dan System Persenjataan, or Primary Defense Weaponry Systems) technology and its impacts often only take place among enthusiasts, academics, advocates, and researchers on technology, defense, and humanitarian issues. Non-governmental organizations such as the Institute of International Studies Universitas Gadjah Mada (IIS UGM) since 2018 has embarked on several approaches involving the public to educate the society on the current condition of LAWS in general, its development in Indonesia, and the impacts of LAWS itself. Aside from IIS UGM, several research centers and non-governmental organizations in Indonesia, such as Research and Operations on Technology and Society (ROOTS) and the International Committee of the Red Cross (ICRC) Regional Delegation to Indonesia and Timor-Leste, who have similar concerns regarding the development of LAWS, also often participate in the efforts to support the mainstreaming of this issue towards the public.

²⁴ Permana, Rakhmad Hidayatulloh. "Diinginkan Jokowi, Sistem Senjata Otonom Dianggap Kontroversial." DetikNews, 23 Januari 2020, <https://news.detik.com/berita/d-4871159/diinginkan-jokowi-sistem-senjata-otonom-dianggap-kontroversial>.





Institute of International Studies (IIS) is a research and advocacy institute under the Department of International Relations, Universitas Gadjah Mada, focusing on security, peace, socio-economic, and international political issues. Since 2018, IIS has worked together with the Campaign to Stop Killer Robots coalition to push the mainstreaming of issues regarding Lethal Autonomous Weapons System and support the efforts to ban this system globally.

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