Lethal Autonomous Weapons Systems (LAWS): Security, Moral and Humanitarian Implications

By Sajid Aziz

Introduction

Lethal Autonomous Weapons Systems (LAWS) have been called "the third revolution in warfare, after gunpowder and nuclear arms"[1]. An autonomous weapon is a system that has the "ability to select and engage targets without human intervention"[2] and is meant to make decisions by itself without human agency. Human Rights Watch (HRW) has dubbed this phenomenon as "human-out -of-the loop"[3]. It is not to be confused with either drones or automated defense systems. The former is remotely piloted by a person, who has the ultimate decision to specifically select targets and hit them, whereas automated defense systems are human-supervised and work in structured and defined roles, fed into their programming. As the British Ministry of Defense says in its reports, "We are not talking about cruise missiles or remotely piloted drones, but about, for example, flying robots that search for human beings in a city and eliminate those who appear to meet certain criteria."[4] International Committee of the Red Cross (ICRC) in Convention on Certain Conventional Weapons (CCW) in its Meeting of Experts defined it as: "An autonomous weapon system is one that has autonomy in its critical functions, meaning a weapon that can select (i.e. search for, detect, identify, track) and attack (i.e. intercept, use force against, neutralize, damage or destroy) targets without human intervention"[5].

Unlike drones and defense systems, autonomous weapons are still in the process of development and are yet to be deployed in a battlefield, though the prospect of autonomous weapons in future warfare cannot be ruled out. At the end of 2015, Pentagon put forward a request of a whooping amount of $12-15 billion for autonomous weaponry for the 2017 budget[6]. Moreover, the US Air Force has predicted that by, "2030 machine capabilities will have increased to the point that humans will have become the weakest component in a wide array of systems and processes"[7]. UK Ministry of Defense in 2011 estimated that, fully autonomous weapons could be available by 2025[8]. Some political pundits have called them idle prognostications.

Lethal Autonomous Weapons Systems (LAWS) or killer robots, as some call them, have generated a great debate among policy makers, academia and scientists vis-à-vis the shifting nature of future warfare and the concomitant security, legal and humanitarian consequences it will likely entail. Proponents of autonomous weapons claim that their development will yield much "cleaner war with less collateral damage" and unlike human beings, who get tired, are easily ideologically influenced and are prone to be misguided, autonomous weapons will have more sophistication and better decision-making capacity on battlefield[9].

On the other hand, some scientists, human rights organizations and NGOs have campaigned for a preemptive ban on Lethal Autonomous Weapons (LAWS) or Lethal Autonomous Robots (LARs). Opponents of autonomous weapons consider them to be a potential lethal technological development that would change the nature of war in unintended ways. Endowing machines with capabilities and responsibilities to supersede human beings not only in their capacity to strike targets but to also make moral

judgments by taking decisions like gauging military gains against collateral damage and distinguishing combatants from civilians, can have serious humanitarian and legal repercussions. In May 2014, the United Nations under the auspices of Convention on Certain Conventional Weapons (CCW) held its first meeting on Autonomous Weapons Systems and explored the issues of moral and legal implications of developing increasingly autonomous weapons[10].

In 2016 the Fifth Review Conference of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons decided to establish a Group of Government Experts (GGE) to further explore the issue of Lethal Autonomous Weapons. The GGE would meet sometime in 2017 to formulate a set of recommendations regarding the future course of action in the realm of LAWS[11]. Besides this, multiple NGOs are working under the banner of the Campaign to Ban the Killer Robots and call for a preemptive ban on autonomous weapons.

Policy Positions of States

It is also important to discuss the policy positions of different states on lethal autonomous robotic weapons. Eighty-seven states participating in the informal meeting of experts of Convention of Certain Conventional Weapons (CCW) on Lethal Autonomous Weapons Systems (LAWS) have put forth a wide spectrum of policy positions, which range from outright ban, a temporary moratorium, to the viability and feasibility of these weapon systems to be an important component of military armory.

Pakistan, Cuba, Ecuador and Egypt have called for a legally binding protocol or agreement to ban the production and manufacture of autonomous weapons. Citing the "illegal, unethical, inhuman and accountable" nature of autonomous weapons and invoking the precedent of non-detectable fragments and blinding lasers, Pakistan called for a preemptive ban effected through a binding CCW protocol[12]. On the other hand, United States of America (USA) and Israel have both alluded to the possibility of introducing autonomous weapons in their military arsenal. In the first CCW experts meeting in May 2014, Israel argued that it found feasible for autonomous weapons to reach certain capabilities to remove apprehensions attendant to the development of LAWS[13]. United States of America (USA) enunciated its policy position on autonomous weapons in a policy directive of Department of Defense (DoD). It states that the US is trying to establish a "prudent, flexible and responsible framework for the development and use of autonomous capabilities in weapons systems including a stringent review process for certain new types of autonomous weapons that might be proposed in future"[14].

France, Germany and United Kingdom have claimed that they neither possess autonomous lethal robotic weapons nor do they intend to acquire them in future. These states have, however, shied away from calling an outright ban on LAWS, stating the need for further substantive deliberations for a future direction[15]. Russia has lauded the efforts of Human Rights Council of United Nations to discuss and create awareness regarding the various consequences of autonomous weapons, but it has shown deep skepticism about CCW's efforts to achieve desired results, thus unnecessarily bloating expectations. Indian policy position on autonomous weapons has focused on their likely security impact and the inevitability of technological gap

among states, encouraging powerful states to rely more on military means to further their national interests since the cost of such ventures would have considerably reduced in future[16]. Though, India has not called for a new set of legally binding protocols to regulate lethal autonomous robotic weapons, it has raised important questions regarding the sufficiency of Article 36 reviews and Martens Clause (both discussed below) to make states to take into account the fact that the development of lethal autonomous robotic weapons does not violate international humanitarian law. Other states, including China, have been less than unambiguous in their official positions and stated the need for greater deliberation and discussion to reach any conclusive decisions.

Humanitarian and Moral Consequences

Since LAWS are still in the process of development and are yet to be deployed in battlefield, the discussion on the humanitarian consequences of autonomous weapons will at best be speculative, but no less significant. The most serious consequence of autonomous weapons systems would be the gradual removal of humans from the battle front and the delegation of decisions of life and death to a machine[17]. The machine will have the autonomy to determine targets and hit them. Most likely it will create a situation for both military and civilian leadership to ethically dissociate themselves from grotesque cost of war[18].

Moreover, since the recorded human history, human reasoning has been the predominant factor in determining the ends and goals of warfare, but autonomous weapons systems hint for the first time the possibility of removing human operators from the war. If recent technological developments have made it possible

for soldiers to "spatially and temporally distance themselves from battlefields"[19], then autonomous weapons systems promise the prospect of altogether supplanting them. Like drones, they will create "asymmetrical safety between belligerents"[20], stimulating the stronger side to adopt a provocative posture.

Nobel Laureate Jody Williams asks, "Where is humanity going if some people think it is okay to cede the power of life and death of humans over to a machine". Some have called it "affront to human dignity and to the sacredness of life"[21]. Not denying the monstrosities and macabre acts committed by human race in past, human disgust at gory scenes of warfare has always been a source of restraint, however ineffectual, but autonomous weapons, unlike human beings, will be bereft of human impulses of compassion, empathy and disgust.

As discussed later, LAWS could possibly undermine arms race stability and might lead to a destabilizing arms race among competitors. Different states designing different algorithms for their autonomous systems quite plausibly raise the specter of unintended consequences. Consequences that can prove lethal for human civilization if they force nuclear weapons states to go to war. In addition, there is the real threat of autonomous weapons operating in situations and environments that are outside the confines of its programming. How will they react in such cases and what possible repercussions do they entail?

But the more important question is: Is moral decision-making by human beings an algorithmic capacity, likely to be emulated and mastered by science? If the answer is not in affirmative and the source of our moral values should be sought in the realm of intuition and non-algorithmic capability, then how can even the

most sophisticated of weapons or computers capture this?[22] These are genuine questions answers to which go a long way in determining the shape of future warfare and human society.

Even if science were to make "ethical" autonomous weapons that could possibly distinguish between combatants and civilians, maintain proportionality and not to resort to indiscriminate killings, who can ensure that they will just be used ethically?

Legal Consequences

Opponents of Lethal Autonomous Weapons Systems(LAWS) have invoked International Humanitarian Law(IHL) to call for a preemptive ban. They claim autonomous weapons systems contravene Geneva Convention and its Additional Protocols, more specifically Article 36 of the 1977 Additional Protocol 1 to the Geneva Convention and as Kanwar explains, consider that "weapon autonomy marks a paradigmatic shift from the so-called humanization of International Humanitarian Law".

The 1949 Geneva Convention obligates states signatory to it to ensure three criteria in any attack: military precaution, proportionality and discrimination. It is relatively easy for automatic weapons defense systems like US MK 15 Phalanx Close-in Weapons System (CIWS), the Counter Rocket, Artillery and Mortar System (C-RAM) as well as Israel's Iron Dome, to sense an incoming munition and neutralize it, as they are pre-programmed to operate in structured and defined roles[23], but the use of autonomous weapons in more complex security environments and urban and population centers and involving autonomous selection of targets makes it extremely difficult to maintain military precaution. Making people skeptical of the

assertion that autonomous weapons will yield "cleaner wars with less collateral damage".

Satisfying the principle of proportionality would be no less difficult. Military proportionality is gauging the military objectives in relation to their potential for collateral damage. Till now no existing weapon system has the capability to autonomously evaluate military gains against its potential cost. How will autonomous weapons systems ensure that they meet this criterion is a moot point. How can they maintain a sufficient level of situation awareness[24] during war and in battlefield? What are the alternatives if the machine malfunctions? How will autonomous weapons react in unanticipated situations that are beyond its programming? Moreover, despite claims by its proponents that given the situational awareness and better decision-making capacity on battlefields by autonomous weapons, people are hard pressed to believe that these systems will ever be able to discriminate between combatants and non-combatants. For example, how do they identify individual fighters from civilians? As James Stuart Russell says, "combatant is not a visual category, rather it is a class of persons engaged in an unidentified set of activities".

In addition, Article 36 of the 1977 Additional Protocol 1 to the 1949 Geneva Convention imposes an obligation, referred to as legal review, on states signatory to it to prevent use and manufacture of weapons that violate and are in contravention of international law, to determine the lawfulness or otherwise of a new weapon or the upgradation of existing ones. It states:
"In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this

Protocol or by any other rule of international law applicable to the High Contracting Party"[25].

A careful perusal of the Article 36 yields the following inferences that it prohibits states from means of warfare restricted by a treaty to which it is a party. Secondly, if the state is not party to such a protocol/treaty, it must examine it against the rules of Additional Protocol 1 and other treaties to which state is a party to. The former includes the conduct for hostilities: discrimination, proportionality and precaution.

Most importantly, if there are no customary laws or pertinent treaties binding the states to regulate the acquisition of new weapons, then the state must consider the weapon in the light of the "Martens Clause". Martens Clause was first found in Hague Convention and later it was made part of Additional Protocol 1 of Geneva Convention which states that, "In cases not covered by the law in force, the human person remains under the protection of the principles of humanity and the dictates of the public conscience"[26].

Human rights organizations and some NGOs campaigning for a ban on Lethal Autonomous Weapons Systems (LAWS) consider it incumbent on states intending to develop such systems that increase autonomy in weapons to implement the afore-mentioned legal requirements.

Manufacture and use of autonomous weapons will also contravene the right to a remedy, enshrined in the Universal Declaration of Human Rights (UDHR). Its article 8 obligates states to ensure that any person whose rights or freedom are violated shall have an "effective remedy"[27]. Right of remedy is dependent on individual accountability. Autonomous weapons,

as defined in the introduction, do not include the element of human agency and are meant to take decision and determine targets themselves. What will be the accountability process in such situations? Who is to be assigned responsibility when systemic errors and malfunction lead to unintended consequences and crimes? Accountability and apportioning responsibility have been two important factors in modern warfare to force a semblance of restraints on the actions of states. Further erosion of these two principles will not only encourage states to low military threshold but also accentuate legal impunity.

Security Implications

Notwithstanding the strong legal and moral case against Lethal Autonomous Weapons Systems (LAWS), security factor/ calculation would be the key issue for states developing or intending to develop autonomous weapons. Do benefits of autonomous weapons outweigh their potential for damage? Those who are for increasing autonomy in weapons system claim that it would be good for soldiers for they would give them greater safety in relation to their rival belligerents. Wars will be less unsavory for autonomous weapons, unlike humans, will have better judgment on battlefield; they can work for greater hours without getting wearied[28]. Even necessary but less dirty wars would be easy to launch because autonomous weapons will supplant human operators from battlefield. There will be no body bags coming back home, the impetus for mass protests against military excursions. The flip side of this argument is that the increasing safety level of soldiers or rather altogether removing them from war, will proportionally hone the appetite of states possessing autonomous weapons to lower the military threshold and go for wars. Impunity and the incapability of one's

rivals to retaliate in kind will encourage states to adopt a more aggressive and provocative approach towards other states. Former US Deputy Defense Secretary, Robert Work, admitted that he made "our competitors to wonder what is behind the black curtain". He also said that new technologies were aimed at ensuring military superiority over Russia and China[29].

Then there is the ominous prospect of a destabilizing global arms race. Once a state develops autonomous weapons to gain a military edge over its rivals, the latter is mostly likely to tread on this path to neutralize the military imbalance. Anna Dragan, an assistant professor at the Berkeley, has hinted at such a possibility and has described it as the "equivalent of very cheap and easily accessible nuclear weapons"[30]. The repercussions on arms race stability would be very negative. The outcome of this technological trajectory would be a burgeoning number of autonomous weapons in possession of many states. This likely prospect of many states acquiring autonomous weapons creates the threat of autonomous warfare.

Besides wrecking the military balance, autonomous weapons will also undermine crisis stability and increase the likelihood of escalation. Firstly, the threshold for the use of force by manned system against autonomous weapons might be considerably lower. The absence of human agency in autonomous weapons might delude the operator of manned system into thinking that he will have a smaller cost to pay if he launched an early attack against AWS. It can also have the effect of "triggering a conflict in an act of miscalculated escalation"[31]. Secondly, as escalation theory explains how initial stages of the conflict will determine how it unfolds, imprudent and rash escalation, taking unnecessary and dramatic risks make the crisis inevitable by making it unlikely to be contained. To avoid

such a dangerous prognosis, it is necessary that autonomous weapons should be recallable and their posture hints that they will not be launched immediately[32]. How will autonomous weapons be called back once activated and engaged in battlefield? The absence of human agency in autonomous weapons will undermine the principles of restraints and recallability, necessary elements not to let a conflict get out of hands.

Lethal Autonomous Robotic Systems (LARS) will create greater complications for smaller states. Military imbalance is already skewed against smaller states, the development of autonomous weapons and their introduction into battlefield will usher in a new era of technological gap that will considerably undermine and compromise the national security of less powerful states. Pakistan aptly calls this a "situation of one-sided killing"[33]. Though it can be plausibly argued that disproportionate distribution of military and technological might among the states is independent of LAWS and even if they are not developed, the military and technological gap will remain between powerful and small states. But the elements of asymmetrical safety, minimum risks involved in military excursions for the aggressor and more importantly the replacement of humans by machines present an ominous prospect for militarily and technologically less capable states. Moreover, small states will be forced in further upgradation of their military capability to at least try to have a semblance of deterrent force against unmatched and awesome military might of rival states, in the process diverting precious meager economic resources on expensive military machines. So, besides military implications, the development of LAWS could possibly have severe economic toll on less powerful states.

Since autonomous weapons will be operated through software, all sorts of technical concerns can arise: malfunction, software errors, communications degradations, cyber-attacks and electronic deceptions. These issues could ultimate produce a situation during tensions which could possibly culminate into greater unwanted escalation.

Conclusion

As discussed in the introduction, Lethal Autonomous Weapons Systems(LAWS) or Lethal Robotic Weapons Systems (LARS) are still in the process of development and their military use and deployment in battlefield is yet to be determined, but it should not lead to complacency given the potential capability of autonomous weapons to alter future warfare in unimaginable and unintended ways. The conclusions drawn from the existing literature on autonomous weapons are at best tentative, though these are suggestive of some ominous prospects: incentivizing wars and military adventurism for the possessors of LAWS, creating greater threats for small states, attenuating the traditional restraints during military tensions and crises and more importantly undermining legal and moral principles for some military tactical gains. These dire prognostication demand concerted efforts by international community-CCW and UN- to work towards the goal of neutralizing the threat of LAWS ever being deployed in future warfare. Pakistan, Egypt, Cuba and Ecuador have taken the lead in this direction, other states have been less unambiguous.

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Endnotes:

[1] "Autonomous Weapons: An Open Letter from AL and Robotics Researchers," *Future of Life Institute* ,July 28, 2015, https://futureoflife.org/open-letter-autonomous-weapons/

[2] Micheal C. Horowitz," Ban Killer Robots? What about defining them first?" *Bulletin of the Atomic Scientists*, 24 June, 2016, http://thebulletin.org/ban-killer-robots-how-about-defining-them-first9571

[3] "Losing Humanity: The Case against Killer Robots," *Human Rights Watch*, November 19, 2012, https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots

[4] Cited by Stuart Russel, "Ban Lethal Autonomous Weapons," *Boston Globe*, September 8, 2015, https://www.bostonglobe.com/opinion/2015/09/07/ban-lethal-autonomous-weapons/2yI2wF0wWRjHLmNQkPiCpI/story.html

[5] "Autonomous Weapons Systems: Is it morally acceptable for a machine to make life and death decisions?" *International Committee of the Red Cross*, April 13, 2015, https://www.icrc.org/en/document/lethal-autonomous-weapons-systems-LAWS

[6] Andrea Shalal, "Pentagon eyes $12-15 billion for early work on new technologies*, Reuters*, December 14, 2015, http://www.reuters.com/article/us-usa-military-technologies-idUSKBN0TX1UR20151214

[7] US Air Force Chief Scientist, "Report on Technology Horizons: A Vision for Air Force Science and Technology during 2010-30," May 15, 2010, http://www.defenseinnovationmarketplace.mil/resources/AF_TechnologyHorizons2010-2030.pdf

[8] "Joint Document Note 2/11, The UK Approach to Unmanned Aircraft Systems," https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/33711/20110505JDN_211_UAS_v2U.pdf

[9] Heather Hoff, "Autonomous Weapons: Not Just Smarter Bombs," *Bulletin of the Atomic Scientists*, December 23, 2015, http://thebulletin.org/autonomous-weapons-civilian-safety-and-regulation-versus-prohibition/autonomous-weapons-not-just-smarter-smart-bombs

[10] "UN meeting targets 'killer robots'," *UN News Centre*, http://www.un.org/apps/news/story.asp?NewsID=47794#.WP2J89KGPct

[11] "Report of the 2016 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS)," http://www.unog.ch/80256EDD006B8954/(httpAssets)/6BB8A498B0A12A03C1257FDB00382863/$file/Recommendations_LAWS_2016_AdvancedVersion+(4+paras)+.pdf

[12] Statement by Pakistan's Second Secretary Irfan Mahmood Bukhari at the meeting of High Contracting Parties in CCW. Available at http://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2014/statements/13Nov_Pakistan.pdf

[13] "Country Policy Positions, Campaign to Stop Killer Robots," *Campaign To Stop Killer Robots*, March 15, 2015, http://www.stopkillerrobots.org/wp-content/uploads/2015/03/KRC_CCWexperts_Countries_25Mar2015.pdf

[14] The Department of Directive Number 3000.09, Autonomy in Weapons Systems," http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf

[15] The official stances of these states on autonomous weapons are available at: http://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2014/statements/13Nov_Germany.pdf, http://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2015/meeting-experts-laws/statements/13April_UK.pdf,

[16] Country Policy Positions, *op.cit*

[17] Mark Gubrud, "Why Should We Ban Autonomous Weapons? To Survive," *IEEE Spectrum,* June 1, 2016, http://spectrum.ieee.org/automaton/robotics/military-robots/why-should-we-ban-autonomous-weapons-to-survive

[18] Micheal C. Horowitz and Paul Scharre, "Morality of Robotic Weapons," *New York Times*, May 26, 2015, https://www.nytimes.com/2015/05/27/opinion/the-morality-of-robotic-war.html?_r=0

[19] Vik Kanwar, "Review Essay: Post-Human Humanitarian Law: The Law of War in the Age of Robotic Weapons," *Harvard National Security Journal*, Volume 2, file:///C:/Users/Maryam-Z/Downloads/SSRN-id1619766.pdf

[20] *ibid*

[21] Quoted in "Making the Case: The Dangers of Killer Robots and the Need for a Preemptive Ban," *Human Right Watch*, December 9, 2016, https://www.hrw.org/report/2016/12/09/making-case/dangers-killer-robots-and-need-preemptive-ban

[22] Morality of Robotic Weapon, *op. cit*

[23] "Losing Humanity: The Case against Killer Robots," *Human Rights Watch*, November 19, 2012, https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots

[24] Comments made at CCW Informal Meeting of Experts on Lethal Autonomous Weapons in Geneva by Lucy Suchman, Professor of Sociology at Lancester. Available at http://www.unog.ch/80256EDD006B8954/(httpAssets)/F321892DC9AE432CC1257F9A004A23FC/$file/2016_LAWS+MX+Presentations_Towardaworkingdefinition_Lucy+Suchman+note.pdf

[25] "Treaties, State Parties and Commentaries," *International Committee of the Red Cross*, https://ihl-databases.icrc.org/ihl/WebART/470-750045?OpenDocument

[26] "Martens Clause," *Weapons Law Encyclopedia*, http://www.weaponslaw.org/glossary/martens-clause

[27] Full text of Universal Declaration of Human Rights is available at http://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf

[28] http://thebulletin.org/autonomous-weapons-civilian-safety-and-regulation-versus-prohibition/autonomous-weapons-not-just-smarter-smart-bombs,opcit

[29] Ariel Conn, Is an AI Arms Race Inevitable?" *The World Post*, March 9, 2017, http://www.huffingtonpost.com/entry/is-an-ai-arms-race-inevitable_us_58c1b907e4b0a797c1d39a71

[30] "Anca Dragan Interview," *The Future of Life Institute*, January 18, 2017 https://futureoflife.org/2017/01/18/anca-dragan-interview/

[31] Michael Carl Hass, "Autonomous Weapons Systems: The Military's Smartest Toys?," *The National Interest*, November 20, 2014, http://nationalinterest.org/feature/autonomous-weapon-systems-the-militarys-smartest-toys-11708

[32] *ibid*

[33] Country Policy Positions, *Campaign to Stop Killer Robots*, *op. cit*