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THEMENSCHWERPUNKT

Regulation Robocop: The Need for International Governance Innovation in Drone and LAWS Development and Use

Melisa Foster and Virgil Haden-Pawłowski*

Abstract: This article builds off of the existing debate on the ethical and regulatory concerns related to drones and lethal autonomous weapons systems (LAWS) and recommends an alternate approach to governing the technology than that advocated by the large international NGO coalition advocating a weapons ban. At this time, LAWS developers and militaries using drones are not conducting adequate legal review in the development and usage planning processes, as is required by International Humanitarian Law (IHL), or are producing highly contestable conclusions, in absence of transparency and public scrutiny. Therefore, the technology's use and development may be in breach of international law and pose great risks to peace and security. This article recommends that an international convention be created within the United Nations (UN) for the control and selective prohibition of certain drone and LAWS technology development and uses.

Keywords: Autonomous robotics, lethal autonomous weapons, legality of use of drones, international humanitarian law, arms control and disarmament.

Schlagworte: Autonome Robotik, tödliche autonome Waffen, Rechtmäßigkeit von Drohnennutzung, humanitäres Völkerrecht, Rüstungskontrolle und Abrüstung

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1. Introduction

Drones and LAWS are more than simply new technology; they are a new method of combat engagement, representing a revolution in military affairs.¹ The current

¹ Arkin, Ronald. 2013. "Lethal Autonomous Systems and the Plight of non-Combatant." *AISB Quarterly* 137 (July): 1.

deployment of certain forms of robotic weapons technology, and the direction of their continuing development and use, are inadequately influenced by international law. While this technology offers strategic advantages and may reduce the need to put military personnel in harm's way, it also creates enormous risks to the erosion or abuse of human rights, peace, national security, ethical conduct in war and international law. This technology has recently received heightened attention from legal experts and human rights advocates in the international community. The UN Special Rapporteur on extrajudicial, summary or arbitrary executions has made recommendations to guide the use of drones and attested the applicability of existing international law.² In November 2013, the annual meeting of the UN Convention on Certain Conventional Weapons (CCW) heard from advocates of a ban on fully autonomous weapons: the Campaign to Stop the Killer Robots,³ a 53-non-governmental-organization strong coalition which includes Human Rights Watch, Amnesty International and the International Committee for Robot Arms Control.⁴ In May 2014, the CCW held the first informal discussions with state parties and experts on LAWS, with formal meetings held in November 2014. Now more meetings of experts have been set, at the time of writing, to take place in April 2015, but it is completely unknown what outcome can be expected of these continuing talks, and when even basic agreements on principles may be reached.⁵ It seems unlikely, however, that relevant LAWS and drone-wielding countries will heed the demands of weapons ban campaign advocates, and the UK delegate only joined CCW talks on the precondition that discussions on drone technology not enter the debate.⁶

This contribution supports the view that the inherent risks associated with drone and LAWS technology, as well as their diversity and complex nature, necessitate the creation of a new international convention to govern their development and use. This option is given precedent by the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (1998), overseen by the Organization for the Prohibition of Chemical Weapons. This convention has been successful in achieving near universal ratification, and continues to serve as a forum for international knowledge sharing among experts via its scientific advisory board. Only a convention of such specific attention to drones and LAWS can meet the governance needs of these revolutionary technologies.

2. Drone and LAWS technology background

Advocates for a pre-emptive ban say that dealing with the legal concerns around drones and LAWS – or “killer robots” –

² Heyns, Christof. 2013. “Extrajudicial, Summary or Arbitrary Executions.” New York: United Nations General Assembly: 22-24.

³ Parnell, Brid-Aine. 2013. “Campaigners Call on The United Nations to Ban Killer Robots.” *Forbes*. www.forbes.com/sites/bridaineparnell/2013/11/13/campaigners-call-on-the-united-nations-to-ban-killer-robots/ (accessed 28/03/2015).

⁴ Campaign to Stop the Killer Robots. 2014. “Who We Are”. www.stopkillerrobots.org/coalition/ (accessed 18/06/2014).

⁵ United Nations Office for disarmament affairs. 2015. “Disarmament-related events calendar”. <http://www.un.org/disarmament/HomePage/calendar/> (accessed 16/03/2014).

⁶ Humanitarian Disarmament. Spring meetings on killer robots. 2015. <http://www.4disarmament.org/2014/03/23/springkillerrobots/> (accessed 28/03/2015).

in a common framework is neither appropriate nor feasible. However, there is a convergence and increasingly blurred line between these technologies that necessitates a universal approach to drone and LAWS regulation. There is no technology gap between a drone that can autonomously target and a drone that can autonomously kill. A simple line of code instructing a drone to follow autonomous target selection with the launch of a missile or firing of a machine gun is the only thing that separates drones from LAWS.

There are new developments in drones and LAWS that have created potentially revolutionary weapons, such as the Super aEgis II sentry gun⁷ and Avenger drone.⁸ It is difficult for researchers to determine the extent of autonomy these machines have been given, in terms of automation in target selection and engagement ‘decisions’. However, looking at the current weapons technology, it is clear that LAWS are able to be, or already are, in development and use.

There is a clear need to improve the transparency of drone and LAWS development and usage in order to monitor their compliance with international law. Considering the ease with which drones could potentially be converted into LAWS, a universal framework that governs both technologies – such as an international convention – is the most appropriate approach.

2.1. Legal challenges facing drones and LAWS

International law remains the most universally accepted mechanism for mitigating and addressing human rights violations during war. It also confines the activities of states to actions that place civilians at reduced risk in war and allows for the achievement of lasting peace to remain feasible in the time following armed conflict. International humanitarian law is complemented by human rights law in a time of armed conflict.⁹

Human rights advocates and topic experts have found drones and/or LAWS poorly compatible with, or innately incapable of adhering to, the following international law principles:

- Distinction (Rule 1, Customary IHL¹⁰): Parties to the conflict must at all times distinguish between civilians and com-

⁷ There are mixed reports about South Korean DoDAMM Systems Ltd.'s Super aEgis II's abilities and deployment status. However, technology commentators who spoke with company representatives at a 2010 South Korean robotics industry expo allege being informed that it is capable of operating in “manual mode” with supervision of a human operator, or in “fully autonomous mode,” permitting autonomous use of lethal force. The company has also allegedly exported units to foreign countries such as the United Arab Emirates. See Blain, Loz. 2010. “South Korea's Autonomous Robot Gun Turrets: Deadly from Kilometers Away.” *Gizmag*. www.gizmag.com/korea-dodamm-superaegis-autonomos-robot-gun-turret/17198/ (accessed 12/03/2013).

⁸ In what appears to be a leaked product video from a staff member of the prolific weapons manufacturer, General Atomics Aeronautical Systems, the company boasts the autonomous targeting abilities of the prototype Predator C Avenger drone. See General Atomics Aeronautical. 2012. “PREDATOR C ‘Avenger’ UAV.” Youtube, June 18. www.youtube.com/watch?v=v0dHKWjXn-E (accessed 12/03/2014). Please note that this is an unconfirmed source.

⁹ OHCHR. “International Legal Protection of Human Rights in Armed Conflict.” Office of the High Commissioner of Human Rights. 2011. http://www.ohchr.org/Documents/Publications/HR_in_armed_conflict.pdf (accessed 28/03/2015).

¹⁰ ICRC. 2014a. “Rule 1: The Principle of Distinction between Civilians and Combatants.” www.icrc.org/customary-ihl/eng/docs/v1_cha_chapter1_rule1 (accessed 28/03/2015).

batants. Attacks may only be directed against combatants. Attacks must not be directed against civilians.¹¹

- Proportionality (Rule 14, Customary IHL¹²): Launching an attack, which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, is prohibited.¹³
- Human right to life (Article 3, Universal Declaration of Human Rights and Article 6, International Covenant on Civil and Political Rights¹⁴): Every person has the inherent right to life, protected by law, and no one shall be arbitrarily deprived of life.¹⁵
- Military necessity¹⁶ (Law of Armed Conflict): Only the use of what “reasonable force is necessary, is lawful and can be operationally justified in combat to make your opponent submit” is permitted.¹⁷
- Accountability (founded in just war theory): Individual accountability for war crimes deters future harm to civilians and provides victims a sense of retribution. The uncertainty around attributing actions of a LAWS to an individual operator, commander, programmer, or state are a general source of concern for enforcing international law on LAWS.¹⁸

Some proponents of drone technology will argue against these points, claiming that the high accuracy of drone strikes in hitting their targets offers them better adherence to the IHL rule of distinction than could be offered in an alternative intervention such as an armed invasion or use of large munitions.¹⁹ This is a purposefully misleading claim in an eristic argument. In fact, in regards to the common present day non-autonomous drones, their proven poor distinction between targets, evidenced by the growing civilian death toll,²⁰ is entirely the fault of target selection procedures carried out by military personnel. While the technology may have very accurate striking abilities compared to infantry attacks in a ground invasion or large munitions, the way in which states, most demonstrably the U.S., have chosen to use them is without sufficient discrimination between civilians and combatants when selecting targets. Whether the subject is remote-controlled drones or LAWS, strike accuracy

does not equate target distinction. Whether or not adherence to these laws and principles can be overcome with advances in technology and changes in the still malleable culture of drone usage norms is yet to be seen.

2.2. On the horizon: Expanded use and variety of drone and LAWS technology

Despite these legal challenges, the share of drone usage in military activities is still expanding and LAWS have remained in development.²¹ Ongoing innovation is resulting in an increasingly diverse drone arsenal in lead countries like the United Kingdom and the United States.²²

Drone use and development is on the rise internationally with the United States holding the largest arsenal (approximately 1,000 lethal drones). This is expected to increase 35 percent by 2021.²³ The US drone industry is projected to be worth US\$18.7 billion by 2018,²⁴ while global research and procurement spending on drones over the next decade is expected to total more than US\$94 billion.²⁵ At least 75 countries around the world have used drones and more than two dozen possess versions that can be lethally armed.²⁶ The economic advantage of these types of weapons will drive their increasing utilization as some popular lethal drones cost from nearly three to five times less than traditional aerial assets of similar function.²⁷

In the United States, the drone industry lobby has paid hundreds of thousands of dollars to members of congress for legislative influence. Meanwhile, individual manufacturers have paid millions of dollars to the Congressional Unmanned Systems Caucus and made payments of over US\$100,000 to individual members of Congress. All with the aim of influencing legislation and securing government procurement contracts that grow the US drone fleet.²⁸

¹¹ Grut, Chantal. 2013. “The Challenge of Autonomous Lethal Robotics to International Humanitarian Law.” *Journal of Conflict & Security Law*: 12.

¹² ICRC. *Rule 14. Proportionality in Attack*. 2014b. <http://www.icrc.org/customary-ihl/eng/docs/v1_cha_chapter4_rule14> (accessed 01/09/2014).

¹³ Grut, “The Challenge of Autonomous Lethal Robotics to International Humanitarian Law,” 10.

¹⁴ United Nations. “The Universal Declaration of Human Rights.” 10 December 1948. *Official Documents System of the United Nations*. 1 September 2014. <<http://daccess-dds-ny.un.org/doc/RESOLUTION/GEN/NR0/043/88/IMG/NR004388.pdf?OpenElement>>: 72.; Office of the High Commissioner for Human Rights. *International Covenant on Civil and Political Rights*. December 16, 1966. <http://www.ohchr.org/en/professionalinterest/pages/ccpr.aspx> (accessed 10/12/2013).

¹⁵ Heller, Kevin Jon. 2013. “‘One Hell of a Killing Machine’: Signature Strikes and International Law.” *Journal of International Criminal Justice*: 91.

¹⁶ Arkin, “Lethal Autonomous Systems and the Plight of non-Combatant,” 6.

¹⁷ ICRC. 2002. “The Law of Armed Conflict: Basic Knowledge.” ICRC. www.icrc.org/eng/assets/files/other/law1_final.pdf (accessed 28/03/2015).

¹⁸ Human Rights Watch. 2012. *Losing Humanity: The Case Against Killer Robots*. New York: Human Rights Watch: 42.

¹⁹ Groves, Steven. 2013. “Drone Strikes: The Legality of U.S Targeting Terrorists Abroad.” *The Heritage Foundation*. <http://report.heritage.org/bg2788:11,13> (accessed 09/06/14).

²⁰ The Bureau of Investigative Journalism. 2013. “Get the Data: Drone Wars.” *The Bureau Investigates*. www.thebureauinvestigates.com/category/projects/drones/drones-graphs/ (accessed 28/03/2015). See footnote 40 for calculation details.

²¹ Anderson, Kenneth and Matthew Waxman. 2013. “Law and Ethics for Robot Soldiers.” *Policy Review*: 35.

²² The UK-developed Taranis and US-developed X-47B Unmanned Combat Air Vehicles are two of the first unmanned aerial vehicles with air-to-air and traditional air-to-land offensive capabilities. They may also be the first aerial drones that could be qualified as LAWS. See Naval Air Systems Command. 2013. “Navy X-47B Unmanned Combat Air System Completes Carrier Tests”. www.navair.navy.mil/index.cfm?fuseaction=home.NAVAIRNewsStory&id=5495 (accessed 20/11/2013).

²³ Lindeman, Todd and Bill Webster. 2011. “The Growing U.S. Drone Fleet.” *The Washington Post*. www.washingtonpost.com/world/national-security/theworld-growing-us-drone-fleet/2011/12/23/gIQA76faEP_graphic.html (accessed 28/03/2015).

²⁴ Editors. 2014. “U.S. Military Unmanned Aerial Vehicles (UAV) Market Forecast 2013-2018.” *Market Research Media*. <http://www.marketresearchmedia.com/?p=509> (accessed 28/03/2015).

²⁵ Editors. 2011. “Teal Group: global UAV market to total \$94 billion in the next ten years.” *Homeland Security News Wire*. <http://www.homelandsecuritynewswire.com/teal-group-global-uav-market-total-94-billion-next-ten-years> (accessed 28/03/2015).

²⁶ Singer, P.W. 2013. “The Global Swarm.” *Foreign Policy*. <http://foreignpolicy.com/2013/03/11/the-global-swarm/> (accessed 11/03/2014).

²⁷ The popular MQ-1 Predator drone, which typically carries hellfire missiles, costs US\$4 million per unit, versus US\$10.7 million for hellfire missile carrying AH-1W SeaCobra, or US\$20 million for AH-64 Apache attack helicopters. See Air Force Financial Management and Comptroller. 2010. “Department of Defense Fiscal Year (FY) President’s Budget Submission.” 4-118. www.saffm.hq.af.mil/ (accessed 11/02/2014): 92. and Assistant Secretary of the US Navy. 1997. “Department of the Navy FY 1998/1999 Biennial Budget Estimates.” Office of the Assistant Secretary of the US Navy: Financial Management and Comptroller. www.finance.hq.navy.mil/FMB/98PREF/PROC/APN_BA_1-4,6,7_BOOK.pdf, 5 (accessed 11/02/2014).

²⁸ Tahir, Madiha. 2014. “The Drone Lobby’s Image Problem.” *Al-jazeera*. <http://fw.to/0cSocYa> (accessed 27/03/2014).

3. Risks of delayed regulatory intervention

3.1. Moral deskilling of the military

Drones and LAWS threaten to deskill the military of their highly important moral skills.²⁹ These technologies reduce soldier-operators' context and time for decision making and delegate more lethal decision making to automated machine processes.

This risks "destabilizing traditional norms of military virtues and their power to motivate ethical restraint in the conduct of war".³⁰ Without a cultivated sense of morality and adequate field training in ethical lethal decision making, soldiers (especially those operating drones) may become more prone to atrocities that are committed as a result of a soldier's post-traumatic stress disorder (PTSD), emotional instability, disconnection from reality, lack of concern for applicable laws, sense of immunity from legal reprisal or a desire for revenge, such as was the case in the Haditha and My Lai massacres.³¹ Such events injure the prospects of a diplomatic end to a conflict and are followed by a shallow, tenuous peace at best.³²

It is imperative to the maintenance of moral skills in the military profession that drone operators have strong battlefield-contextual information and more than just a fraction of a second to make decisions of military necessity, distinction, acceptable civilian deaths, and compassion – on the battlefield. This becomes increasingly difficult if individual operators control multiple lethal drones, if the speed of drone manoeuvres outpaces wireless data signal or human response times and if drones are increasingly autonomous.

3.2. Reduction of barriers to war and incentives for peace

According to the UN Special Rapporteur on extrajudicial, summary or arbitrary executions, the availability of drones and autonomous weapons systems is resulting in more "low-intensity but drawn-out applications of force that know few geographical or temporal boundaries".³³ Potentially autonomous sentry weapons, like the Super aEgis II, can completely replace soldiers. The Super aEgis II was produced by South Korea for the ongoing conflict with North Korea – a situation with no end in sight. In a way, these weapons become a self-fulfilling means of warfare. By sheer economic advantage, they allow for an indefinite perpetuation of armed conflict. Therefore, if use of this technology increases, the usual incentives for peace – created by the economic and human costs of ongoing war – will become smaller and smaller.

²⁹ Vallor, Shannon. 2013. "The Future of Military Virtue: Autonomous Systems and the Moral Deskilling of the Military." 5th Annual Conference on Cyber Conflict. Tallinn: NATO CCD COE Publications, 2013: 2, 7.

³⁰ Vallor, "The Future of Military Virtue: Autonomous Systems and the Moral Deskilling of the Military," 1.

³¹ A 2013 study found that drone pilots suffer PTSD and other mental health problems at the same rate as pilots of manned aircraft in Iraq and Afghanistan. See Dao, James. 2013. "Drone Pilots Are Found to Get Stress Disorders Much as Those in Combat Do." The New York Times, available at: <http://nyti.ms/17YAymi> (accessed 7/02/2014).

³² Vallor, "The Future of Military Virtue: Autonomous Systems and the Moral Deskilling of the Military," 5.

³³ Heyns, "Extrajudicial, Summary or Arbitrary Executions," 5.

3.3. Proliferation

Parties buying military technology from Israeli, US and South Korean manufacturers already have access to some of the most cutting-edge military robotics available. With this technology, regional powers such as China,³⁴ India and Russia will gain more readily extended territorial control and advantages in prolonged conflicts in contested territories such as various East China Sea Islands, Kashmir or even newer contested regions such as Crimea in the Ukraine. This poses a threat to weak states and, for better or worse, enhances the power of regional hegemony. The potential for non-state actors to eventually gain access to drone and LAWS technology in its current, or a future form, must also inform policy intervention. The advantages of these technologies to insurgent non-state groups in asymmetrical warfare are the same as the advantages to states.³⁵

As with armaments and landmines, drones and LAWS may come to be abandoned during a retreat or unintentionally transferred to third parties. Countries such as Cambodia are plagued by millions of anti-personnel landmines and unexploded ordnance, which continue to kill and maim civilians decades after the war.³⁶ These same risks of transfer and recovery can exist for drones and LAWS.

3.4. Civilian killings and blowback

Payload carrying drones are alleged to have precision targeting and delivery, but how their targets are selected is a critical problem.³⁷ "Signature strikes" are lethal drone strikes on human targets, whose identities are not known and who were discovered and selected through drone surveillance solely based on their patterns of behaviour.³⁸ There are risks of direct attacks on civilians with this uniquely weak discrimination in target selection and engagement with drone technology.

From 2002-2015, US drone strikes in Pakistan, Yemen, Somalia and Afghanistan may have killed as many as 5,705 human targets, with potentially as many as 1,322 later discovered to be innocent civilians, 255 of them children in upper end estimates.³⁹ According to Amnesty International and Human

³⁴ China is already in the process of developing a functional drone fleet, see McDonald, Mark. 2012. "Growth in China's Drone Program Called 'Alarming.'" *Rendezvous* (blog), November 27. http://rendezvous.blogs.nytimes.com/2012/11/27/growth-in-chinas-drone-program-called-alarming/?_r=0 (accessed 28/03/2015).

³⁵ Allegedly, Hezbollah in Lebanon already has access to small lethal drones of Iranian origin, see Shane, Scott. 2011. "Coming Soon: The Drone Arms Race." The New York Times, October 8. <http://nyti.ms/1AnEmp8> (accessed 28/03/2015).

³⁶ Cambodian Mine Action Centre. 2009. "Ten Years." www.cmac.gov.kh/userfiles/file/ten-years.pdf: 6 (accessed 28/03/2015).

³⁷ Hudson, Leila, Colin S. Owens and Matt Flannes. 2011. "Drone Warfare: Blowback from the New American Way of War." Middle East Policy Council. <http://www.mepc.org/journal/middle-east-policy-archives/drone-warfare-blowback-new-american-way-war#> (accessed 28/03/2015).

³⁸ Heller, "'One Hell of a Killing Machine': Signature Strikes and International Law," 1.

³⁹ Calculations were made by the authors by summing upper end estimates in the categories "total killed" for all strike categories for each country under the "Casualty estimates" column on the sourced website. Likewise sums of upper end estimates for civilians killed and children killed were used for the respective referenced figures. It is worth noting that the estimates in first version of this publication, released in October 2014, were substantially lower. Since that time, more strikes have since increased the death toll by nearly 1000 total kills and more than 250 civilian deaths. Also note that the greatest number of lethal drone strikes were in Pakistan and Yemen where the U.S. has no express military mission. See The Bureau of Investigative Journalism. "Get the Data: Drone Wars." (accessed 28/03/2015).

Rights Watch, several of these civilian killings were done at random and without discrimination, and therefore could amount to war crimes.⁴⁰

An inadequate response to this poor precedent for acceptable drone usage risks normalizing a disregard for civilian lives or seeing it exaggerated when other parties are behind the trigger. It also puts drone-user states at risk of “blowback”, increased hostility from the civilian population and increased insurgent recruitment.⁴¹

4. Existing policy frameworks and proposals

4.1. Encourage states to more rigorously apply the “new weapons legal review process”

Article 36 of the 1949 Geneva Convention Additional Protocol 1 states that, “In the study, development, acquisition or adoption of a new weapon, means or method of warfare” the state must, “determine whether [a weapon’s] employment would, in some or all circumstances, be prohibited by international law”.⁴² Article 82 complements Article 36 by requiring that “legal advisors are always available to advise military commanders on International Humanitarian Law and on the appropriate instruction to be given to the armed forces on this subject”.⁴³

Although the weapon itself may not be new according to Article 36, signature strikes as well as autonomous targeting and engagement are new means and methods of warfare that must be subject to the legal review process. Among the more than two dozen countries that possess lethal drones, only six have been confirmed to have a new weapon legal review process in place, with even fewer making the documents outlining the review protocol public. Among those countries is the United States, who has been accused of violating the IHL principle of distinction and the right to life,⁴⁴ based on their use of drone signature strikes.⁴⁵

Increased use of, and transparency in, the required new weapon legal review process has been called for by the United Nations Special Rapporteur on this matter.⁴⁶ To do so may or may not produce different outcomes for countries seeking new weapons technology and weapons uses, but increased transparency should at least allow for appropriate public scrutiny on the adequacy of reviews and rationale given by states for presuming the legality of a new weapons and means or methods of warfare.

The present and future ability of drones and LAWS to be consistent with existing international law is questionable. If

the use of this review process is rigorous and is proliferated among drone-user states, we may see some, but not all, of the previously listed risks mitigated.

4.2. A pre-emptive ban on autonomous weapons technology and the automation of lethal decision making

The proponents of this option assert that existing international humanitarian law and human rights require human judgment in lethal decision making. Although lethal drones presently in deployment are not yet themselves LAWS, it is expected that LAWS and LAWS enhanced drones will find their way into military arsenals in the near future.

The further development of robotic weapons and LAWS may pose grave threats to the basic human rights of civilians in conflict zones. Justification for action is thus grounded in a moral and legal duty to prevent lethal authority being given to unsupervised non-human systems.⁴⁷

Such a ban could potentially be implemented in the form of an annexed protocol under the CCW, as was done with blinding laser weapons. Alternatively, a ban could be implemented as an independent treaty, similar to the Ottawa treaty banning anti-personnel landmines, created after the CCW failed to produce such a ban.⁴⁸ However, considering the industry and strategic value of the technology, as well as the lobbying power in the United States, a ban faces considerable political resistance. Furthermore, while this technology carries with it serious risks to humanity, some have argued that the potential humanitarian benefits be given due consideration.⁴⁹

5. Policy recommendations

The United Nations should create an international convention on the control and selective prohibition of certain drone and LAWS development and use. The United Nations Secretary-General should add to the provisional agenda for the next General Assembly meeting a report reflecting the concerns addressed in this brief and a proposal for a General Assembly Resolution to task the First Committee with the creation of a new convention dealing with this issue. A convention would be flexible enough to accommodate the future controlled development of the technology for appropriate and beneficial uses, while enabling restriction of prohibited technology and uses. This would complement existing law, as well as support international communication in better guiding technological development in adherence with common interpretations of applicable laws. The convention could set technological and usage standards and principles, based in international law, that would specifically delineate legal requirements for use and

⁴⁰ BBC News. 2013. “US Drone Strike Killings in Pakistan and Yemen ‘Unlawful.’” BBC News, October 22. www.bbc.com/news/world-us-canada-24618701 (accessed 28/03/2015).

⁴¹ Hudson, Owens and Flannes, “Drone Warfare: Blowback from the New American Way of War,” 1.

⁴² Lawland, Kathleen. 2006. “Reviewing the Legality of New Weapons, Means and Methods of Warfare.” Cambridge: International Review of the Red Cross: 10.

⁴³ Lawland, “Reviewing the Legality of New Weapons, Means and Methods of Warfare,” 5.

⁴⁴ ICRC. 2006. “A Guide to the Legal Review of New Weapons, Means and Methods of Warfare.” Guiding Document. Geneva: ICRC: 5, 6.

⁴⁵ Heller, “‘One Hell of a Killing Machine’: Signature Strikes and International Law,” 89, 113.

⁴⁶ Heyns, “Extrajudicial, Summary or Arbitrary Executions,” 20.

⁴⁷ Asaro, Peter. 2012. “On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-making.” International Review of the Red Cross: 687-690.

⁴⁸ Interview with Paul Heinbecker, CIGI distinguished fellow, September 5, 2014.

⁴⁹ Anderson, Kenneth and Matthew Waxman. “Law and Ethics for Robot Soldiers,” 35-50.

development of drone and LAWS technology. Lethal autonomy in weapons is inevitable or already here, and so what must be regulated is in which battlefield environments it is acceptable, who can be held responsible for the machine's actions and what the principles governing the autonomous weapons' behaviors, or even what any restrictions to their 'reasoning' and 'judgement' in automated lethal decision trees, will be. This governing body may one day be tasked with establishing precise technical guidelines for 'acceptable civilian casualties' or the guideline for self-destruct or surrender procedures if unacceptable civilian casualties are expected or if a LAWS gun turret or autonomous drone becomes lost or abandoned in a retreat. The establishment of this governing body may result in a ban on such uses of drones and LAWS as the indiscriminate signature strikes and definition of as well as regulation on sufficient human control and judgment in lethal actions taken by LAWS.

In a forthcoming article by Buchanan and Keohane, the authors similarly propose an international Drone Accountability Regime, comparing it to the Missile Technology Control Regime (MTCR). While these authors consider the challenges to establishing such a governance regime on drone use to be so great that the best that can be hoped for is an informal agreement rather than a treaty, their proposal for a system of accountability for drone strikes runs parallel to the proposals described herein.⁵⁰ Whether a Drone Accountability Regime can exist within a governing body for drone and LAWS development and use or vice versa, establishing a means to hold states and operators accountable for drone strikes and the lethal actions of LAWS must be inalienable components of any international convention on drone and LAWS development and use.

The international convention should provide a forum for communication between stakeholders, the scientific community and legal experts. This proposed convention must provide a forum for communication between policy makers, international law and military experts, and the scientific community to offer a continually evolving and relevant body of regulations. As with the Chemical Weapons Convention, this can be supported by an overseeing organization and a scientific advisory board that meet on a regular basis to review new and existing technology. This should result in not only international bans on certain technology uses and types, but also in an improved application of the new weapons legal review process by domestic actors. This approach would simultaneously protect the strategic and industry value of the technology and allow for its guided development in adherence to existing laws. This is important for not only the vested industry and political interests to be reconciled, but also to protect humanitarian interests, as the technology may eventually assist in reducing the risk of war crimes and civilian casualties in conflict. This may occur by LAWS someday offering adherence to IHL principles, such as distinction, to a superior degree than humans are capable of.⁵¹

It should further be considered that the use of drones, and the reduced barrier to war they create, may cause military missions with humanitarian objectives to become more politically acceptable. This is because a mission, for example, to protect a civilian population from their genocidal government, may present great risks to an intervening foreign military. Future drone and LAWS humanitarian missions may be seen as low political risk, low personnel risk and low asset risk interventions that can be used when sending military personnel is not feasible.

6. Conclusion

The existing governance tools available for evaluating the legality of drone and LAWS technology and their use have either failed to gain prominence or have proven ineffective. This has resulted in the continued development and use of drone and LAWS technologies which may be prohibited under international law. These revolutionary weapons require immediate governance innovation on account of the serious risks they pose to the protection of human rights, peace and security. To address this gap in governance, the creation of a new convention to monitor, evaluate and regulate drone and LAWS technology and their use is recommended. It is only through such a universal forum, with access to up-to-date scientific, ethical and legal assessments, that it can be ensured that these technologies are developed and used in adherence with existing laws and ethical traditions. At the very least, such a universal forum would facilitate the dialogue necessary to establish basic principles for the regulation of these technologies, and determine if existing moral precepts will prevail.

Above all, the political will of governments and the leadership of influential states is needed. We now have an opportunity to protect the next generation from experiencing the kinds of horrors perpetuated by technology like landmines that wrecked so much havoc during and after conflicts in the past century. We have only seen the tip of the iceberg in terms of the dangers autonomous and robotic weapons can bring, and the benefits they might hold if used responsibly. World leaders must acknowledge this and bow to the need for cooperation at this early stage. If not, a drone and LAWS arms race may force unbridled robotic weapons development down such a diverging and uninhibited path that we may never find our way back to humanity.

⁵⁰ Buchanan, Allen, and Robert O. Keohane. 2015. "Toward a Drone Accountability Regime." *Ethics & International Affairs*: 15-37.

⁵¹ Anderson and Waxman, "Law and Ethics for Robot Soldiers," 49; Arkin, "Lethal Autonomous Systems and the Plight of non-Combatant," 5.