

# KILLER ROBOTS OR SOLDIERS OF THE FUTURE: LEGAL ISSUES AND INDIA’S ROLE IN THE LETHAL AUTONOMOUS WEAPONS DEBATE

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## I. INTRODUCTION

In November 2017, a short film was screened at the meeting of the United Nations Convention on Certain Conventional Weapons (CCW) in Geneva. Titled ‘Slaughterbots’, it showed a contractor advertising his latest product – a small drone with artificial intelligence that has the ability to find, target and kill.<sup>1</sup> The film goes on to show the drones fall into the wrong hands, get unleashed onto the world and proceed to wreak havoc by indiscriminately shooting people in the head.<sup>2</sup>

This dramatic, yet powerful film was screened at the CCW meeting for a significant reason. At the time, the 2018 Group of Governmental Experts

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<sup>1</sup> Ben Brimelow, ‘The Short Film “Slaughterbots” Depicts a Dystopian Future of Killer Drones Swarming the World’ Business Insider <<https://www.businessinsider.in/the-short-film-slaughterbots-depicts-a-dystopian-future-of-killer-drones-swarming-the-world/articleshow/61732012.cms>> accessed 9 March 2020.

<sup>2</sup> *ibid.*

(GGE) on Lethal Autonomous Weapons Systems (LAWS) was meeting under the aegis of 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 (Convention on Certain Conventional Weapons or CCW). Set up in December 2016 by the Fifth Review Conference of the High Contracting Parties to the CCW<sup>3</sup>, the GGE has been tasked to examine “emerging technologies in the area of lethal autonomous weapons systems in the context of the objectives and purposes of the Convention”.<sup>4</sup> The 2017, 2018 and 2019 iterations of the GGE concluded with reports, and the process is expected to continue in 2020-2021 as well.

The GGE on LAWS is attempting to address this profound problem of regulating lethal autonomous weapons but their task is not easy. This is exacerbated by the particular view that LAWS in the truly autonomous sense do not currently exist, a view shared not only by several analysts<sup>5</sup> but also states.<sup>6</sup> They argue that any attempts to regulate this technology is premature since it is almost impossible to predict how and what an actually lethal autonomous weapon would look like in the future. Indeed, *Slaughterbots* was dismissed by critics as an alarmist and exaggerated portrayal of the ‘killer robot’ technology that is popular in dystopian science fiction movies.<sup>7</sup>

But a definition of LAWS that only focuses on pure autonomy is also problematic since it effectively excludes and ignores *increasing* autonomy. Skepticism notwithstanding, it is now no longer disputed that weapons development is steadily moving towards increasing autonomy and not less. The role played by humans in using advanced weaponry has lessened to a great extent, and is set to lessen further. This is perhaps not unexpected, given that this trend is not unique to just weapons, but of technology itself,

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<sup>3</sup> Hayley Evans, ‘Lethal Autonomous Weapons Systems at the First and Second U.N. GGE Meetings’ (*Lawfare*, 9 April 2018) <<https://www.lawfareblog.com/lethal-autonomous-weapons-systems-first-and-second-un-gge-meetings>> accessed 8 March 2020.

<sup>4</sup> ‘Report of the 2017 Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS)’ (United Nations 2017) CCW/GGE.1/2017/3 1.

<sup>5</sup> Michael Schmitt, ‘Autonomous Weapon Systems and International Humanitarian Law: A Reply to the Critics’ [2013] *Harvard National Security Journal Features* 6 <<https://harvardnsj.org/2013/02/autonomous-weapon-systems-and-international-humanitarian-law-a-reply-to-the-critics/>> accessed 9 March 2020. See Rebecca Crootof, *The Killer Robots Are Here: Legal and Policy Implications*, 36 *Cardozo L Rev* 1837, 1863-70 (2015).

<sup>6</sup> ‘Report of the 2017 Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS)’ (n 5) 7.

<sup>7</sup> Paul Scharre, ‘Why You Shouldn’t Fear “Slaughterbots” - IEEE Spectrum’ *IEEE Spectrum: Technology, Engineering, and Science News* (22 December 2017) <<https://spectrum.ieee.org/automaton/robotics/military-robots/why-you-shouldnt-fear-slaughterbots>> accessed 10 March 2020.

generally.<sup>8</sup> From self-driving cars in the automotive industry to robot assisted surgery in healthcare, the adoption of increasingly sophisticated technology is being endorsed for reducing human error and increasing productivity and efficiency in almost every field.

It is not surprising that the defence and national security field are no exceptions to this trend. Additionally, the dual-use nature of artificial intelligence (AI) has been and continues to be a huge enabler.<sup>9</sup> Strides in autonomous navigation and data analysis can not only improve civilian navigation, but also the mobility of drones or sentry bots, for instance.<sup>10</sup> Machine learning and deep learning not only have the potential to improve precision in robotic surgery, but also precision in strike capability in autonomous weapons.

In any discussion on LAWS, it is important to distinguish between autonomy and automation simpliciter. While autonomous weaponry is relatively new, automation of weapons technology has long been in existence. Remote piloting is one example. In the United States, at least one in three US Air Force aircraft is remotely piloted.<sup>11</sup>

Automation simpliciter, like the kind described above, has a certain level of human control and is hence not the main subject of contestation. Remotely piloted drones, for instance, do not act on their own and are instead controlled by a person who takes all the cognitive decisions. But new forms of automation are resulting in increasing *autonomy* to the weapons technology, i.e., the ability to act independently without human input. These weapons can, in theory at least, select and engage targets on their own without any human intervention. In fact, a South Korean company has already reportedly developed a lethal sentry robot called the SGR-A1 Sentry Guard Robot, that can be used not only for patrolling its highly militarized border, but also has the ability to identify targets and engage in hostilities on its own without human intervention.<sup>12</sup> It is this kind of technology that has led to

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<sup>8</sup> Kenneth Anderson and Matthew C. Waxman, 'Law and Ethics for Autonomous Weapon Systems: Why a Ban Won't Work and How the Laws of War Can' [2013] *The Hoover Institution* 33, 2.

<sup>9</sup> See Maaïke Verbruggen, 'The Role of Civilian Innovation in the Development of Lethal Autonomous Weapon Systems' (2019) 10 *Global Policy*.

<sup>10</sup> *ibid.*

<sup>11</sup> Spencer Ackerman and Noah Shachtman, 'Almost 1 In 3 U.S. Warplanes is a Robot' *Wired* (1 September 2012) <<https://www.wired.com/2012/01/drone-report/>> accessed 10 March 2020.

<sup>12</sup> Alexander Velez-Green, 'The Foreign Policy Essay: The South Korean Sentry—A "Killer Robot" to Prevent War' (*Lawfare*, 1 March 2015) <<https://www.lawfareblog.com/foreign-policy-essay-south-korean-sentry%E2%80%9494-killer-robot-prevent-war>> accessed 10 March 2020.

calls for regulation, if not a total ban, on the development of such weapons technology.

These developments have not gone unnoticed by India. Shedding its usual reticence with issues concerning international law, India is grappling with LAWS in a big way, first chairing the 2017 GGE session through Ambassador Amandeep Gill, India's permanent representative to the Conference on Disarmament and continuing to be an active participant in the preceding and successive sessions.<sup>13</sup> At home, India set up a multi-stakeholder task force under the Ministry of Defence to study the strategic implications of AI for national security and defence whose terms of reference include recommendations for the use of both defensive and offensive AI in several areas including aviation, naval, land systems, cyber, as well as nuclear.<sup>14</sup> The NITI Aayog also recently released the National Strategy on Artificial Intelligence, setting out India's goals vis-à-vis AI capabilities and mapping the path to reach them.<sup>15</sup> Clearly, India has no intention of being left out of the benefits that LAWS could confer. But it also appears that, rather than participate in a LAWS rat race against nations that have vastly different technological (and indeed monetary) capabilities compared to itself, India is set on its own course to develop, incorporate and utilize LAWS technology in a manner that is in keeping with its own unique experiences as part of the global south.

This paper traces the politico-legal discussions surrounding autonomous weapons and unpacks the major legal issues plaguing scholarly and governmental debates around LAWS. The authors first lay out a typology of autonomy to better understand issues and concerns with such weapons systems. The article then examines the broad legal framework with which these weapons will be required to comply and within whose boundaries these weapons will be required to be operated. The authors proceed to trace major States' views on LAWS under the auspices of the United Nations Convention on Conventional Weapons. Finally, the authors examine Indian efforts towards increasing autonomy in defence technology and assess how best autonomous weaponry can be deployed in the Indian scenario.

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<sup>13</sup> Bedavyasa Mohanty, 'Amidst Calls for a Ban, India Leads the Debate on Lethal Autonomous Weapons' *The Wire* (18 November 2017) <<https://thewire.in/external-affairs/amidst-calls-ban-india-leads-debate-lethal-autonomous-weapons>> accessed 4 February 2020.

<sup>14</sup> Press Information Bureau, 'Raksha Mantri Inaugurates Workshop on AI in National Security and Defence' Ministry of Defence, Government of India (21 May 2018).

<sup>15</sup> National Strategy on Artificial Intelligence (June, 2018), <[https://niti.gov.in/writereaddata/files/document\\_publication/NationalStrategy-for-AI-Discussion-Paper.pdf](https://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf)>; See also Yogima Sharma, 'Niti Aayog Proposes Rs 7,500-Crore Plan for Artificial Intelligence Push' *The Economic Times* (20 May 2019) <<https://economictimes.indiatimes.com/news/economy/policy/niti-aayog-proposes-rs-7500-crore-plan-for-artificial-intelligence-push/article-show/69403255.cms?from=mdr>> accessed 22 March 2020.

## II. DEFINITIONAL CONSTRAINTS – HUMANS IN, ON AND OUT OF THE LOOP

There is currently no agreed definition for autonomous weapons.<sup>16</sup> But the definition used by the Department of Defence (DoD) in the United States appears to be gaining traction. The US DoD defines an autonomous weapons system as “a weapon system that, once activated, can select and engage targets without further intervention by a human operator.”<sup>17</sup>

To use the DoD’s phrase, “intervention by a human operator” can take different forms. One form requires a human to direct the system to select a target and attack it, referred to as “human-in-the-loop”.<sup>18</sup> For instance, fire and forget weapons that require humans to choose and zero-in on the targets before launch are “in-the-loop” systems. In the DoD Directive, these systems are referred to as “semi-autonomous systems”.<sup>19</sup> The MQ-9 Reaper used earlier this year (at the time of writing) by the US to strike and kill *Qasem Suleimani*, a general of Iran’s Islamic Revolutionary Guard Corps,<sup>20</sup> also falls under the “in-the-loop” category.

Another form is one in which the system selects, targets and attacks them under human oversight who can override the system’s actions if needed, referred to as “human-on-the-loop”.<sup>21</sup> The Patriot air defence system which has been in use by the United States for several years can independently target and engage missiles and is an example of “on-the-loop” systems.<sup>22</sup> Israel’s Iron Dome which automatically targets and engages incoming missiles from Gaza, is another example. The US DoD refers to these systems as

<sup>16</sup> See Rebecca Crootof, *The Killer Robots Are Here: Legal and Policy Implications*, 36 *Cardozo L. Rev.* 1837, 1847-54 (2015). See also Kenneth Anderson et al., *Adapting the Law of Armed Conflict to Autonomous Weapon Systems*, 90 *Int’l L. Stud.* 386, 388-90 (2014).

<sup>17</sup> U.S. Dep’t of Def., Directive 3000.09, *Autonomy In Weapon Systems* 13–14 (Nov. 2, 2012), available at <<http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf>> [hereinafter *Dod Directive 3000.09*].

<sup>18</sup> Bonnie Docherty, ‘*Losing Humanity: The Case against Killer Robots*’ (Human Rights Watch 2012) 2.

<sup>19</sup> U.S. Dep’t of Def., Directive 3000.09, *Autonomy In Weapon Systems* 14 (Nov. 2, 2012), available at <<http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf>> [hereinafter *Dod Directive 3000.09*].

<sup>20</sup> Peter Baker and others, ‘Seven Days in January: How Trump Pushed U.S. and Iran to the Brink of War’ *The New York Times* (11 January 2020) <<https://www.nytimes.com/2020/01/11/us/politics/iran-trump.html>> accessed 11 April 2020.

<sup>21</sup> Docherty (n 19) 2.

<sup>22</sup> Patriot Missile Long-Range Air-Defence System, US Army (Army Technology) <<https://www.army-technology.com/projects/patriot/>> accessed 11 April 2020.

“human-supervised autonomous systems”.<sup>23</sup> They are considered a type of autonomous weapons system, as opposed to semi-autonomous systems.

A fully autonomous weapon or a human-out-of-the-loop weapon i.e., one that can select and engage targets without any further control by humans such as the one described by the US DoD is not yet in existence. To quote *Schmitt*, these weapons have not yet “left the drawing board”.<sup>24</sup>

### III. THE LEGAL FRAMEWORK FOR LETHAL AUTONOMOUS WEAPONS

Despite LAWS being a relatively new development, inter-governmental discussions on LAWS are not taking place in vacuum. The International Court of Justice (ICJ) in its 1996 Advisory Opinion on the Legality and Threat or Use of Nuclear Weapons was clear, that international humanitarian law “[p]ermeates the entire law of armed conflict and applies to all forms of warfare and to all kinds of weapons, those of the past, those of the present and those of the future.”<sup>25</sup>

States have also expressed little disagreement with this view, with the GGE on LAWS achieving consensus that the development and use of LAWS should be governed by the rules posited in international humanitarian law or the law of armed conflict.<sup>26</sup> This is unlike other efforts such as the Group of Governmental Experts on Development of Information and Communication Technology in Cyberspace, for instance, which managed to agree on the applicability of international law to cyberspace only as recently as 2013.<sup>27</sup> Despite this being reaffirmed in 2015<sup>28</sup>, this consensus is still threadbare, with states continuing to heavily contest the contours of international law in cyberspace, rendering the certainty in the LAWS GGE all the more surprising.

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<sup>23</sup> U.S. Dep’t of Def., Directive 3000.09, *Autonomy In Weapon Systems* 13 (Nov. 2, 2012), available at <http://www.dtic.mil/whs/directives/corres/pdf/300009p.pdf> [hereinafter *Dod Directive 3000.09*].

<sup>24</sup> *Schmitt* (n 6) 3.

<sup>25</sup> *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1. C.J. Reports 1996 (“*Legality of the Threat or Use of Nuclear Weapons*”), para 86.

<sup>26</sup> ‘Report of the 2017 Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS)’ (n 5) para 16(b).

<sup>27</sup> ‘Report of the Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security’ (2013) A/68/98 para 19.

<sup>28</sup> ‘Report of the Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security’ (2015) A/70/174 para 25.

Since international humanitarian law is applicable, all weapons are required to be capable of being used and also be used in accordance with its rules.<sup>29</sup> Under these rules, weapons can either be unlawful *per se* or can be *used* in an unlawful manner. The two rules under which weapons can be *per se* unlawful are -

- (a) Means or methods of warfare that cause superfluous injury or unnecessary suffering are prohibited.<sup>30</sup>
- (b) Weapons that are by nature indiscriminate, i.e., weapons that cannot be targeted at a specific military objective, are prohibited.<sup>31</sup>

The first rule is the reason why blinding lasers that cause permanent blindness are banned *per se*, since they are perceived to cause ‘superfluous injury’, which means that they cause suffering without any military purpose.<sup>32</sup> Other examples include weapons that have the effect of injuring through non-detectable fragments which ordinarily cannot be detected using X-rays and hence, cannot be treated and cause suffering.<sup>33</sup> The ICJ has also noted that this prohibition ensures that “States do not have unlimited freedom of choice of means in the weapons they use”<sup>34</sup>, as well as declared the rule as one of the “cardinal principles contained in the texts constituting the fabric of international humanitarian law”<sup>35</sup>.

The second rule covers anti-personnel mines, for instance, which obviously do not discriminate between combatants and civilians. These mines can also remain active for a long time even after the end of the conflict, and endanger civilians.<sup>36</sup> Although the ban on mines is imposed under a separate convention, that is, the Anti-Personnel Mines Convention, the source of the underlying principle is the same.

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<sup>29</sup> Neil Davison, ‘A Legal Perspective: Autonomous Weapon Systems under International Humanitarian Law’ (International Committee of the Red Cross) UNODA Occasional Papers No 30 7 <[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=2ahUKewiZ7tKcgLD0AhULbisKHVyiA xkQFjACegQI-BRAB&url=https%3A%2F%2Fwww.icrc.org%2Fen%2Fdownload%2Ffile%2F65762%2Fautonomous\\_weapon\\_systems\\_under\\_international\\_humanitarian\\_law.pdf&usg=AOvVaw3Yo2nsxEesyDwKBvi9K07G](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=2ahUKewiZ7tKcgLD0AhULbisKHVyiA xkQFjACegQI-BRAB&url=https%3A%2F%2Fwww.icrc.org%2Fen%2Fdownload%2Ffile%2F65762%2Fautonomous_weapon_systems_under_international_humanitarian_law.pdf&usg=AOvVaw3Yo2nsxEesyDwKBvi9K07G)> accessed 23 March 2020.

<sup>30</sup> Art 35(2), Additional Protocol II.

<sup>31</sup> Art 51(4), Additional Protocol I.

<sup>32</sup> Schmitt (n 6) 9.

<sup>33</sup> Protocol on Non-Detectable Fragments (Protocol II), Annexed to Convention on Certain Conventional Weapons, 185.

<sup>34</sup> Legality of the Threat or Use of Nuclear Weapons (n 26), para 78.

<sup>35</sup> *ibid.*

<sup>36</sup> Yoram Dinstein, *The Conduct of Hostilities under the Law of International Armed Conflict* (Cambridge University Press 2004) 68.

Weapons that are not themselves rendered unlawful by the rule against causing superfluous injury and the prohibition on indiscriminate weapons, can still be *used* unlawfully, if used in violation of certain principles - the principles of distinction, proportionality and precautions in attack.<sup>37</sup>

The principle of distinction requires distinguishing between the civilian population and the combatants as well as between civilian objects and military objectives and ensuring action only against military objectives.<sup>38</sup> The principle of proportionality refers to the rule that legitimate target may not be attacked if the collateral civilian casualties would be disproportionate to the specific military gain from the attack.<sup>39</sup> While it cannot be identified from any one rule, it can be gathered from several provisions in Additional Protocol I to the Geneva Conventions of 1949.<sup>40</sup> The principle of precautions in attack refers to the obligation upon those who plan or decide upon an attack to take certain active precautions including verification to ensure the objectives are military, choosing means and methods to minimize incidental civilian injury and refraining from launching an attack that would be in breach of the principle of proportionality.<sup>41</sup> These principles place obligations upon combatants, who will also be liable for violations thereof.<sup>42</sup>

Separately, Article 36 of the Additional Protocol I mandates a legal review of all new weapons, means and methods of warfare to determine whether their employment would in some or all circumstances be prohibited by any rule in international law.<sup>43</sup> This provision has particular significance vis-à-vis autonomous weapons, since it requires countries to assess whether the use of a projected weapon could breach international humanitarian law.

According to *Dinstein*, it is those weapons whose “normal or expected use” would violate IHL prohibitions that would be *per se* unlawful<sup>44</sup>, as opposed to regular weaponry that could potentially be used in breach of any of the precautionary, distinctive or proportionality principles.

Lastly, the Martens Clause, which requires that in cases not covered by existing treaties, civilians and combatants remain protected by customary

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<sup>37</sup> Davison (n 30) 7.

<sup>38</sup> Art 48, Additional Protocol I.

<sup>39</sup> Legality of Threat or Use of Nuclear Weapons (n 26), p. 587.

<sup>40</sup> *ibid.*

<sup>41</sup> *Dinstein* (n 37) 125.

<sup>42</sup> Davison (n 30) 7.

<sup>43</sup> Art 36, Additional Protocol I to the Geneva Conventions, 1977.

<sup>44</sup> *Dinstein* (n 37) 80.



IHL, the principles of humanity, and the dictates of the public conscience<sup>45</sup>, is also considered a yardstick to evaluate autonomous weapons.

#### IV. TO BAN OR NOT TO BAN? SOME LEGAL CONSIDERATIONS

Autonomous weapons are a subject of major controversy, leaving states as well as experts sharply divided. As of November 2018, 28 states have called for a ban on fully autonomous weapons,<sup>46</sup> while several of the developed states, including Russia, United Kingdom and the United States are in opposition to any pre-emptive ban<sup>47</sup>. Leading the charge against LAWS, Human Rights Watch (HRW) and Harvard Law School's International Human Rights Clinic in 2012 issued a seminal report titled "Losing Humanity- The Case Against Killer Robots", in which they have articulated their arguments for a pre-emptive ban.

On the other hand, there are those who feel that a pre-emptive ban is premature, among whom *Michael Schmitt*, a professor at the US Naval War College, figures prominently.<sup>48</sup> In a detailed rebuttal to *Losing Humanity*, Schmitt has responded to HRW's arguments and has laid out the case for why LAWS, like other weapons, can conform to international humanitarian law. Despite the flux of time, these two opposing views still embody the main cases for and against LAWS and are discussed below. It is important to bear in mind that this discussion pertains to *fully* autonomous weapons which are still only a futuristic prospect, and not increasingly autonomous or automated weapons.

In *Losing Humanity*, HRW lays the charge that fully autonomous weapons are *per se* illegal since they would be incapable of "abiding by the key principles of international humanitarian law"<sup>49</sup>, which according to the report, consist of the principles of (a) distinction, (b) proportionality, (c) military necessity and (d) the Martens Clause. For his part, *Schmitt* has argued that this is not the case.

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<sup>45</sup> Preamble to the 1907 Hague Convention IV; art 63, Geneva Convention I; art 1(2), Additional Protocol I; Preamble to Additional Protocol II.

<sup>46</sup> 'Country Views on Killer Robots' (Campaign to Stop Killer Robots 2018).

<sup>47</sup> Damien Gayle, 'UK, US and Russia among Those Opposing Killer Robot Ban' *The Guardian* (29 March 2019) <<https://www.theguardian.com/science/2019/mar/29/uk-us-russia-opposing-killer-robot-ban-un-ai>> accessed 5 April 2020.

<sup>48</sup> Schmitt (n 6); Anderson and Waxman (n 9); Rebecca Crootof, 'The Killer Robots Are Here: Legal And Policy Implications' 36 *Cardozo Law Review* 79.

<sup>49</sup> Docherty (n 19) 30.

## A. Distinction

Firstly, HRW argues that fully autonomous weapons would not be able to conform to the principle of distinction, i.e., they would not have the ability to sense or interpret the difference between soldiers and harmless civilians, especially in contemporary combat environments,<sup>50</sup> thereby being *per se* illegal. It gives the example of human soldiers being capable of recognizing children with toy guns enabling them to refrain from attack, as opposed to a robot which would only be able to sense two armed individuals and may very well proceed to eliminate them.<sup>51</sup>

To this, *Schmitt* argues that even fully autonomous weapons that are completely incapable of distinguishing between combatants and civilians are not *per se* unlawful, since they can be deployed in purely military battlespaces in which civilian presence is highly unlikely, such as naval warships, or remote parts of a desert.<sup>52</sup> This argument is similar to the one made in defence of the legality of nuclear weapons before the ICJ by the United Kingdom during the hearings leading up to the ICJ's Advisory Opinion.<sup>53</sup> In that case, the United Kingdom had also argued that it was incorrect to argue that nuclear weapons can *per se* be illegal on account of the principle of distinction since it could be used in areas where civilians are completely absent or have a high likelihood of absence.<sup>54</sup> The fact that the ICJ was ultimately unable to rule that nuclear weapons were illegal, preferring instead to rule that it simply could not rule either way, is telling.

*Schmitt* also argues that military technology is advancing and that software enabling visual identification of individuals is likely to be developed<sup>55</sup>, as well as points out that enemies disguise themselves as civilians all the time and even regular human-operated machines have been thwarted by this<sup>56</sup>. Additionally, he questions HRW's assumption of human-operated weaponry's superiority over autonomous ones by referring to the US warship, the USS Vincennes, accidentally engaging an Iranian airliner carrying civilians in 1992, since it mistakenly believed they were about to attack the ship.<sup>57</sup>

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<sup>50</sup> *ibid.*

<sup>51</sup> *ibid* 32.

<sup>52</sup> *Schmitt* (n 6) 11.

<sup>53</sup> Para 3.70, Statement of the Government of the United Kingdom, Legality of the Threat or Use of Nuclear Weapons (Request for an Advisory Opinion by the United Nations General Assembly), International Court of Justice (June 1995).

<sup>54</sup> *ibid.*

<sup>55</sup> *Schmitt* (n 6) 11.

<sup>56</sup> *ibid* 12.

<sup>57</sup> *ibid* 13.

This led to the Iranian airliner being shot down, killing all 290 passengers on board.<sup>58</sup>

## B. Proportionality

Secondly, HRW argues that full autonomy in weaponry would not allow compliance with the rule of proportionality in international humanitarian law, since it requires “human judgement”.<sup>59</sup> Drawing on several sources, including the US Air Force<sup>60</sup>, HRW asserts that determining whether the expected collateral damage exceeds the anticipated military advantage is a highly subjective exercise that can only be determined on a case-to-case basis<sup>61</sup>. It quotes the International Criminal Tribunal for Former Yugoslavia (ICTY) which held that to determine whether an attack is proportionate, “it is necessary to examine whether a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack”.<sup>62</sup>

Taking the example of a robot dealing with enemies in a populous urban area, HRW asserts that assessments of proportionality are required to be made in constantly evolving situations with numerous, changing factors, which can never be “boiled down to a simple algorithm”.<sup>63</sup>

This argument also does not convince *Schmitt* who, while acknowledging that proportionality assessment is highly context related, again relies on advancing technology to rebut HRW. *Schmitt* admits that proportionality calculations require careful balancing of expected collateral damage and anticipated military advantage.<sup>64</sup> But then he points to existing methodologies in use for calculating expected collateral damage, such as the “collateral damage estimate methodology” (CDEM), whereby an attack force considers

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<sup>58</sup> Michael R. Gordon, ‘U.S. Account of Downing of Iran Jet Criticized’ *The New York Times* (2 July 1992) <<https://www.nytimes.com/1992/07/02/world/us-account-of-downing-of-iran-jet-criticized.html>> accessed 5 April 2020.

<sup>59</sup> Docherty (n 19) 32.

<sup>60</sup> Air Force Judge Advocate General’s Department, “Air Force Operations and the Law: A Guide for Air and Space Forces” first edition, 2002, <[http://web.law.und.edu/Class/militarylaw/web\\_assets/pdf/AF%20Ops%20&%20Law.pdf](http://web.law.und.edu/Class/militarylaw/web_assets/pdf/AF%20Ops%20&%20Law.pdf)> (accessed April 5, 2020), p.27.

<sup>61</sup> Docherty (n 19) 33.

<sup>62</sup> *Prosecutor v Stanislav Gali*, International Tribunal for the Prosecution of Persons Responsible for Serious Violations of International Humanitarian Law Committed in the Territory of Former Yugoslavia since 1991 (ICTY), Case No. IT-98-29-T, Judgment and Opinion, December 5, 2003, <<http://www.icty.org/x/cases/galic/tjug/en/gal-tj031205e.pdf>> (accessed October 4, 2012), para. 58.

<sup>63</sup> Docherty (n 19) 34.

<sup>64</sup> Schmitt (n 6) 19.

“factors as the precision of a weapon, its blast effect, attack tactics, the probability of civilian presence in structures near the target, and the composition of structures to estimate the number of civilian casualties likely to be caused during an attack”.<sup>65</sup> According to Schmitt, since such programs are themselves reliant on scientific algorithms, weapons systems that are incorporated with them should be “no less likely to generate a reliable result” as far as expected collateral damage is concerned.<sup>66</sup>

With regard to assessing the anticipated military advantage, *Schmitt* is less certain given the “complexity and fluidity of the modern battlespace”, and acknowledges that impressive advances in military intelligence notwithstanding, it is “unlikely in the near future” that machines will be programmable to perform robust assessments of a strike’s military advantage.<sup>67</sup> However, he still maintains that military advantage algorithms could theoretically be programmed into machines<sup>68</sup> and in any case, sees no reason why, pending the development of such technology, this should necessitate a pre-emptive ban on autonomous weapons. He also relies on the International Committee of the Red Cross’s (ICRC) authoritative commentary which states that the proportionality test allows for a “fairly broad margin of judgement” and “must above all be a question of common sense and good faith for military commanders”<sup>69</sup> to conclude that neither humans nor machines are held to a standard of perfection and that the applicable standard in international humanitarian law is always a standard of reasonableness<sup>70</sup>.

### C. Military Necessity

Next, HRW believes that fully autonomous weaponry will also cause friction with the requirements of military necessity.<sup>71</sup> According to the ICRC, the principle of military necessity in international humanitarian law permits measures which are actually necessary to accomplish a legitimate military purpose and are not otherwise prohibited by international humanitarian law.<sup>72</sup> HRW argues in *Losing Humanity* that the very development of LAWS

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<sup>65</sup> *ibid.*

<sup>66</sup> Docherty (n 19) 20.

<sup>67</sup> Schmitt (n 6) 20.

<sup>68</sup> *ibid.*

<sup>69</sup> ICRC, Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949, <<http://www.icrc.org/ihl.nsf/COM/470-750073?OpenDocument>> (accessed April 5, 2020), pp. 679, 682.

<sup>70</sup> Schmitt (n 6) 21.

<sup>71</sup> Docherty (n 19) 34.

<sup>72</sup> ‘Military Necessity | How Does Law Protect in War? - Online Casebook’ (ICRC) <<https://casebook.icrc.org/glossary/military-necessity>> accessed 5 April 2020.

will render them *militarily necessary*, thereby propagating their widespread use by nations.<sup>73</sup>

*Schmitt* simply argues that this would not render LAWS unlawful *per se* and in any case, the other requirements of distinction and mainly proportionality render any assessment of LAWS against military necessity superfluous.<sup>74</sup> *Schmitt* also criticizes HRW's understanding of military necessity as a separate principle on its own, as opposed to being "a foundational principle that undergirds the entire body of law".<sup>75</sup>

#### D. Martens Clause

Finally, HRW also argues that any usage of LAWS causes serious concerns under the Martens Clause.<sup>76</sup> The Martens Clause provides that in cases not covered by existing treaties, civilians and combatants remain protected by customary IHL, the principles of humanity, and the dictates of the public conscience.<sup>7778</sup> The ICRC also agrees with HRW, having expressed the view that the Martens Clause is the link between ethical considerations and IHL, making it "particularly relevant to the assessment of autonomous weapon systems".<sup>79</sup> The ICJ in the Advisory Opinion had also observed that the Martens Clause "proved to be an effective means of addressing rapid evolution of military technology."<sup>80</sup>

HRW relies on a study conducted by *Ronald Arkin*, an American roboticist, the results of which indicated that the majority of the participants found it unacceptable that autonomous weapons could be used to take human lives.<sup>81</sup> Taking this to indicate the "dictates of the public conscience", HRW argues that there was no willingness among the public to accept the deployment of LAWS and therefore, any such use or deployment would fall foul of the Martens Clause.<sup>82</sup>

*Schmitt's* response to this is that by its own wording the Martens Clause is only applicable in cases not covered by existing treaties.<sup>83</sup> *Schmitt* believes

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<sup>73</sup> Docherty (n 19) 35.

<sup>74</sup> Schmitt (n 6) 22.

<sup>75</sup> *ibid.*

<sup>76</sup> Docherty (n 19) 35.

<sup>77</sup> Davison (n 30) 8.

<sup>78</sup> Art 1(2), Additional Protocol I.

<sup>79</sup> Davison (n 30) 8.

<sup>80</sup> Legality of the Threat or Use of Nuclear Weapons (n 26), para 78.

<sup>81</sup> Docherty (n 19) 36.

<sup>82</sup> *ibid.*

<sup>83</sup> Schmitt (n 6) 32.

that since international humanitarian law already extensively covers LAWS, there is no requirement to evaluate LAWS against the Martens Clause.<sup>84</sup>

### E. Who won?

*Losing Humanity* effectively captures the major legal issues plaguing discussions of autonomous weaponry. HRW is right to warn governments and the rest of the world about the challenges inherent in LAWS that will make compliance with the tenets of the law of armed conflict difficult. *Schmitt's* response to HRW's challenges, while an excellent counter on law, is somewhat over-reliant on the promise of advancing technology and its potential to match up to human-levels of judgement and consciousness.

Scientists and technologists themselves dispute this optimism. *Noel Sharkey*, a leading roboticist who has long called for a ban on LAWS, believes it unlikely that computing machinery will meet the requisite standards in the foreseeable future and that while improvements are expected, significant change enabling reliability is also not likely.<sup>85</sup> *Sharkey* stated that "human-level discrimination with adequate common sense reasoning and battlefield awareness may be computationally intractable".<sup>86</sup> *Sharkey* also believes that while computers are better than humans at tasks such as calculating numbers, searching large data sets and simultaneously carrying out repetitive tasks, humans are better than computers at other tasks such as deliberative reasoning, reasoning inductively and exercising meaningful judgement.<sup>87</sup> An open letter was also issued in 2017, to the CCW by the founders of 116 leading AI and robotics companies across 26 countries, warning the CCW about the "pandora's box" that will be opened should nations proceed with LAWS development and use.<sup>88</sup>

But *Schmitt's* response contained some solutions as well. He is correct in stating that LAWS do not have to distinguish if only used in purely combat zones, such as naval warships at sea or remote desert locations. Other rules such as proportionality will still have to be complied with, but the fact that the technology to do so does not exist now does not mean that countries

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<sup>84</sup> *ibid.*

<sup>85</sup> Noel Sharkey, 'Speaker's Summary | Autonomous Weapons and Human Supervisory Control', *Expert Meeting* (ICRC 2014) 29.

<sup>86</sup> Noel E. Sharkey, 'The Evitability of Autonomous Robot Warfare' (2012) 94 *International Review of the Red Cross* 787, 789 <[https://www.cambridge.org/core/product/identifier/S1816383112000732/type/journal\\_article](https://www.cambridge.org/core/product/identifier/S1816383112000732/type/journal_article)> accessed 8 April 2020.

<sup>87</sup> Sharkey (n 86) 29.

<sup>88</sup> Open Letter to the United Nations Convention on Certain Conventional Weapons (2017), Noel Sharkey, 'Autonomous Weapons and Human Supervisory Control', *Expert Meeting* (ICRC 2014) 29. accessed 8 April 2020.

should not try to develop it. Ultimately, *Schmitt's* argument can be boiled down to this – that autonomous weapons are by themselves not illegal under IHL and there is no requirement for a pre-emptive ban on the development of autonomous weapons right now. The authors find it difficult to disagree.

Cognizant of both sides of the argument, States have already advanced past this and introduced several nuances in the debate under the aegis of the CCW. It also appears that the concerns raised in *Losing Humanity* have not gone unheard, with several States acknowledging the necessity of human involvement in the functioning of autonomous weaponry to ensure compliance with IHL, and several having already declared that they will not be developing fully autonomous weaponry, that is, weaponry that can fully function without human involvement.

Japan, for instance, announced in its Working Paper presented to the 2019 GGE that it does not plan to develop fully autonomous weapons systems.<sup>89</sup> The United States has also acknowledged that it believes human-involvement is necessary.<sup>90</sup> This led to the introduction of the concept of *meaningful human control* over weapons systems as well as an attempt to identify mechanisms in IHL, such as those under Article 36 of Additional Protocol I to the Geneva Conventions, to permit the controlled development of LAWS that are compliant with IHL.

## V. TOWARDS A COMMON UNDERSTANDING – THE GGE ON LAWS

In 2016, the Fifth Review Conference of the High Contracting Parties to the CCW decided to establish a Group of Governmental Experts (GGE) on LAWS with the goal to “explore and agree on possible recommendations on options related to emerging technologies in the area of LAWS”.<sup>91</sup> Informal expert meetings under the aegis of the CCW were already taking place since 2014 and states formally joined the discussions in the form of the GGE starting 2017. It was subsequently reconvened in 2018 and also had a 2019 session which concluded in November 2019. The 2017 report acknowledged the applicability of international humanitarian law to all weapons systems

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<sup>89</sup> ‘Possible Outcome of 2019 GGE and Future Actions of International Community on LAWS - Working Paper to the Group of Governmental Experts Meeting of 2019 Submitted by Japan’ (Government of Japan) 3 <<https://www.mofa.go.jp/mofaj/files/000459707.pdf>> accessed 9 April 2020.

<sup>90</sup> Department of Defence Directive, 3000.09

<sup>91</sup> Recommendations to the 2016 CCW Review Conference, submitted by the Chairperson of the Informal Meeting of Experts, 2016.

as well as recognized the importance of assessing aspects of human-machine interaction.<sup>92</sup>

The 2018 GGE achieved considerable progress, evolving a set of Guiding Principles applicable to LAWS.<sup>93</sup> These include IHL's full applicability to LAWS, the necessity of retaining human responsibility for decisions on the use of weapon systems as well as studies needing to be carried out by individual states to determine whether a weapon, means or method of warfare would be prohibited under international law.<sup>94</sup> The 2019 Report added one principle to this, namely, aspects of human machine interaction in the development, deployment and use of emerging technologies in the area of lethal autonomous weapons systems'.<sup>95</sup>

While the GGE has discussed several important aspects related to autonomous weapons throughout its sessions, most discussions centre around what the nature and level of the human-machine interaction should be, as well as how to have in-built compliance with IHL in autonomous weapons, or at least, increasingly autonomous weapons. In a way, the nature of human control as well as the legal review mechanisms under IHL have formed central themes.

### A. Human Control

The idea of retaining human-control has been around at least since the informal expert meetings in 2014.<sup>96</sup> It seems states agree that giving *full* autonomy to weapons systems would not augur well, neither under technological wisdom as scholars such as *Sharkey* have espoused, nor under IHL. The result is that there is an "effective consensus" that human control is essential.<sup>97</sup> Now, encompassing terms such as human-in-the-loop and human-on-the-loop, the term "meaningful human control" and its variations such as "effective human control" have gained prominence. The ICRC has also called for meaningful human control to be maintained over weapons systems.<sup>98</sup>

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<sup>92</sup> 'Report of the 2017 Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS)' (n 5) para 16(b).

<sup>93</sup> 'Report of the 2018 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems' (2018) CCW/GGE.1/2018/3 4.

<sup>94</sup> *ibid.*

<sup>95</sup> 'Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems' (2019) CCW/GGE.1/2019/3 3.

<sup>96</sup> 'Report of the 2014 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS)' (2014) CCW/MSP/2014/3 para 35.

<sup>97</sup> Japan, 'Possible Outcome of 2019 Group of Governmental Experts and Future Actions of International Community on Lethal Autonomous Weapons Systems (Working Paper)' (2019) CCW/GGE.1/2019/WP.3 para 26.

<sup>98</sup> Davison (n 30) 11.



This was also echoed by India in its statement to the 2019 GGE on the human element in the use of lethal force, in which it affirmed that “human control must be maintained over all weapons systems” including LAWS.<sup>99</sup> Apart from this, India also expressly rejected full autonomy with no communication link or control since it “contradicts the basic operational tenets of decision making based on situational awareness and operational control by the commander”.<sup>100</sup> India also stated that it believed human-in-the-loop was “ideal” but quick reaction systems may need to be governed by at least humans on the loop.<sup>101</sup>

Some countries have expressed different views. The United States, although agreeing that human involvement is necessary, believes that terms such as “control” may not be helpful.<sup>102</sup> In a working paper submitted to the 2018 GGE, the US sets out its position on human-machine interaction and why it prefers to use the term “levels of human judgement over the use of force” instead.<sup>103</sup> It cites its Department of Defence Directive 3000.09 which requires that autonomous and semi-autonomous weapon systems “be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force.”<sup>104</sup> “Human judgment” in this sense differs from “control” in that it involves broader human involvement in decisions about how, when, where, and why the weapon will be employed<sup>105</sup>, whereas “control” could require a much higher level of power or restraint over the weapon.

The US argues that the key issue or human-machine interaction in emerging technologies in the area of LAWS is “ensuring that machines help effectuate the intention of commanders and the operators of weapons systems”.<sup>106</sup> Enabling “human judgement”, it believes, is a better way of achieving this than focusing on “control”. The US also criticizes the emphasis on “control”

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<sup>99</sup> ‘Statement by India: Further Consideration of the Human Element in the Use of Lethal Force; Aspects of Human Machine Interaction in the Development, Deployment and Use of Emerging Technologies in the Area of Lethal Autonomous Weapons Systems’ (2019).

<sup>100</sup> *ibid.*

<sup>101</sup> *ibid.*

<sup>102</sup> United States, ‘Human-Machine Interaction in the Development, Deployment and Use of Emerging Technologies in the Area of Lethal Autonomous Weapons Systems (Working 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) CCW/GGE.2/2018/WP.4 para 43.

<sup>103</sup> *ibid* 2–3.

<sup>104</sup> DoD Directive 3000.09, 4.a.

<sup>105</sup> Kelley M. Sayler, ‘Defense Primer: U.S. Policy on Lethal Autonomous Weapon Systems’ [2019] Congressional Research Service 3 <<https://fas.org/sgp/crs/natsec/IF11150.pdf>>.

<sup>106</sup> United States (n 103) para 1.

since how each weapons system is controlled is often specific to that weapons system and this can vary from system to system.<sup>107</sup>

Russia for its part has also acknowledged that human control over the operation of such systems is an “important limiting factor.”<sup>108</sup> However, significantly, it also states that it believes specific forms and methods of human control should remain at the discretion of States.<sup>109</sup> Australia’s view of control appears to overlap with the legal review process under Article 36 of Additional Protocol I. In its working paper, it presents a broad concept of control that “incrementally builds upon itself, embedding controls onto military processes and capability at all stages of their design, development, training and usage”.<sup>110</sup> It appears to take a weapons system-specific approach, indicating that control will be “tailored to the specific AWS and its unique operating environment”.<sup>111</sup> Even though this may be a useful way to operationalize control, as opposed to a broad based, one-size-fits-all “human control” concept that has to be applied to all weapons system, it is hard to see how states can avoid elaborating or fleshing out minimum principles, or redlines at the very least, for establishing human control.

## B. Legal Review Mechanisms: Article 36 of Additional Protocol I

The other hotly contested issue in the GGE for LAWS is the question of carrying out legal reviews of weapons under Article 36 of Additional Protocol I. Article 36 mandates states to “determine whether [a new weapon’s] 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”.<sup>112</sup> This applies equally to means or methods of war as well.<sup>113</sup>

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<sup>107</sup> *ibid* 48.

<sup>108</sup> Russian Federation, ‘Potential Opportunities and Limitations of Military Uses of Lethal Autonomous Weapons Systems (Working 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) CCW/GGE.1/2019/WP.1 7.

<sup>109</sup> *ibid* 7.

<sup>110</sup> Australia, ‘Australia’s System of Control and Applications for Autonomous Weapon Systems (Working 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) para 7.

<sup>111</sup> *ibid* 9.

<sup>112</sup> Art 36, Additional Protocol I.

<sup>113</sup> *ibid*.

According to the ICRC, the lawfulness of an autonomous weapons system will depend on its specific characteristics and whether, given those characteristics, it can be employed in conformity with the rules of IHL in all circumstances in which it is intended and expected to be used.<sup>114</sup> Such a legal review must also necessarily consider treaty and customary prohibitions and restrictions on specific weapons, as well as the general IHL rules applicable to all weapons, means and methods of warfare.<sup>115</sup>

The ICRC goes on to state that “such a review entails fully understanding the weapon’s capabilities and foreseeing its effects, notably through verification and testing” and that the legal review must demand a “very high level of confidence” that the autonomous weapon system would “predictably and reliably operate as intended”.<sup>116</sup> HRW has expressed the view that “these reviews should begin in the early stages of development, address all configurations of the weapons, and consider such key principles of international humanitarian law as distinction, proportionality, and military necessity” as well as the Martens Clause.<sup>117</sup>

States such as Australia, New Zealand and Austria, among others, have expressed the view that rigorous compliance with the requirements of Article 36 would ensure compliance with international law.<sup>118</sup> However, the fact that several countries have not ratified Additional Protocol I, including India, is a significant problem with looking to Article 36 as a way of ensuring LAWS compliance with IHL. One solution to this is accepting the view offered by the ICRC<sup>119</sup> as well as scholars<sup>120</sup>, that Article 36 is reflective of customary international law. Despite not having ratified Additional Protocol I, Israel<sup>121</sup> and United States still follow a detailed weapons review mechanism.

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<sup>114</sup> Davison (n 30) 9.

<sup>115</sup> *ibid* 10.

<sup>116</sup> *ibid*.

<sup>117</sup> Docherty (n 19) 26.

<sup>118</sup> Ray Acheson, ‘CCW Report’ *Reaching Critical Will, Women’s International League for Peace and Freedom 5* <<http://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2018/gge/reports/CCWR6.9.pdf>> accessed 11 April 2020.

<sup>119</sup> ICRC, ‘A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977’ (Geneva: ICRC, 2006), <[http://www.icrc.org/eng/assets/files/other/icrc\\_002\\_0902.pdf](http://www.icrc.org/eng/assets/files/other/icrc_002_0902.pdf)> (accessed October 30, 2012), p 4.

<sup>120</sup> Schmitt (n 6) 28.

<sup>121</sup> Maya Yaron, Statement at the Group of Experts Meeting on Lethal Autonomous Weapons Systems: Lethal Autonomous Weapons Systems, UNOG (April 11, 2016), <[www.unog.ch/80256EDD006B8954/%28httpAssets%29/A02C15B2E5B49AA1C1257F9B0029C454/\\$file/2016\\_LAWS\\_MX\\_GeneralDebate\\_Statements\\_Israel.pdf](http://www.unog.ch/80256EDD006B8954/%28httpAssets%29/A02C15B2E5B49AA1C1257F9B0029C454/$file/2016_LAWS_MX_GeneralDebate_Statements_Israel.pdf)>

Another problem with relying on Article 36 is that there is no standardized procedure for such review even among states parties to Additional Protocol I. Each country adopting its own review mechanisms may not ensure a uniform development, let alone usage of LAWS. This has led to a call for national contributions in the GGE on how each state understands and carries out weapons review to try and formulate some form of ‘best practices’ that can be applied across the board.

The United States, Belgium, Spain, the Netherlands and the United Kingdom have all expressed keenness to collate national contributions detailing compliance under Article 36.<sup>122</sup> China, on the other hand, has doubted the effectiveness of review mechanisms in ensuring compliance with IHL given the complexity of automated systems and has also voiced concerns that reviews may pose a risk of legitimizing “undesirable” weapons.<sup>123</sup>

### C. Other Issues

Several other issues were also topics of discussion in the GGE, such as the form any regulation of LAWS would take. In the 2018 GGE, Austria, Brazil and Chile proposed a mandate to negotiate a legally-binding instrument,<sup>124</sup> emphasizing that clarity could only be provided through a legal instrument. Despite receiving majority support including from the African Union, the Non-Aligned Movement and even China<sup>125</sup>, this proposal was effectively blocked by the US and Russia, among others, who feel such a treaty would be premature.<sup>126</sup> As scholars have also noted, one strong argument for rejecting a binding treaty is the lack of an agreed definition for LAWS.<sup>127</sup>

Another suggestion came from Argentina, Australia and United Kingdom, who proposed continuing discussions on LAWS<sup>128</sup>, presumably through forums such as the GGE under the CCW.

A third way was proposed by France and Germany, who called for a “political declaration” to identify areas of consensus and formulate guiding principles.<sup>129</sup> This approach also gained some traction, with ten other states

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<sup>122</sup> Acheson (n 119) 5.

<sup>123</sup> *ibid.*

<sup>124</sup> Hayley Evans and Natalie Salmanowitz, ‘Lethal Autonomous Weapons Systems: Recent Developments’ (7 March 2019) <<https://www.lawfareblog.com/lethal-autonomous-weapons-systems-recent-developments>> accessed 11 April 2020.

<sup>125</sup> Acheson (n 119) 4.

<sup>126</sup> Evans and Salmanowitz (n 125).

<sup>127</sup> Crootof (n 49) 1841.

<sup>128</sup> Evans and Salmanowitz (n 125).

<sup>129</sup> *ibid.*

supporting it.<sup>130</sup> Belgium also supported this view, stating that it did not preclude later options such as binding treaties.<sup>131</sup>

Several states also renewed the call for a ban, which was predictably opposed by states such as Russia and the US. Interestingly, China supports a ban, but only as far as using LAWS is concerned.<sup>132</sup> Given that China is developing its own LAWS<sup>133</sup> this is understandably viewed as a strategic move by China to buy itself time till it deems itself LAWS-capable.<sup>134</sup>

## VI. BACK HOME: INDIA AND LETHAL AUTONOMOUS WEAPONS

India has seen a renewed focus on issues pertaining to defence and national security in the last decade. The “surgical strike” on Pakistani soil in response to the *Pathankot* terrorist attack in 2016 was meant to show the world that India had no qualms about resorting to military strength should it be subjected to attacks such as the one at Uri.<sup>135</sup> Similarly, the *Pulwama* attack in 2019, in which a convoy transporting paramilitary personnel was blown up leaving at least 40 dead in Jammu & Kashmir, was responded to with air-strikes by the Indian Air Force deep inside Pakistan territory in Balakot.<sup>136</sup>

In subsequent instances, the Indian Government, speaking strongly through senior voices, has made it clear that it will not hesitate to “cross

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<sup>130</sup> *ibid.*

<sup>131</sup> Acheson (n 119) 4.

<sup>132</sup> Elsa Kania, ‘China’s Strategic Ambiguity and Shifting Approach to Lethal Autonomous Weapons Systems’ (*Lawfare*, 17 April 2018) <<https://www.lawfareblog.com/chinas-strategic-ambiguity-and-shifting-approach-lethal-autonomous-weapons-systems>> accessed 11 April 2020.

<sup>133</sup> Air Force News, ‘In June, the Air Force Will Host the “Unmanned Competition” Intelligent UAV Cluster System Challenge’ (WeChat Official Accounts Platform) <[http://mp.weixin.qq.com/s?\\_\\_biz=MzA4ODU2Mzg3Ng==&mid=2650013877&idx=1&sn=00a75aafd-2f48a979d4d933d2668f4c8&chksm=8828e97ebf5f6068092fdd9a61e4a420c-c75449acbacdc2b4e9d41c0fc01cc6b24f5a4feccf4#rd](http://mp.weixin.qq.com/s?__biz=MzA4ODU2Mzg3Ng==&mid=2650013877&idx=1&sn=00a75aafd-2f48a979d4d933d2668f4c8&chksm=8828e97ebf5f6068092fdd9a61e4a420c-c75449acbacdc2b4e9d41c0fc01cc6b24f5a4feccf4#rd)> accessed 11 April 2020.

<sup>134</sup> Kania (n 133).

<sup>135</sup> Nikhil A. Gokhale, ‘The Inside Story of India’s 2016 “Surgical Strikes”’ *The Diplomat* (23 September 2017) <<https://thediplomat.com/2017/09/the-inside-story-of-indias-2016-surgical-strikes/>> accessed 10 April 2020.

<sup>136</sup> Staff Reporter, ‘Balakot: Indian Air Strikes Target Militants in Pakistan’ *BBC News* (26 February 2019) <[https://www.bbc.com/news/world-asia-47366718?intlink\\_from\\_url=https://www.bbc.co.uk/news/topics/cx3ezqn30pmt/india-pakistan-relations&link\\_location=live-reporting-story](https://www.bbc.com/news/world-asia-47366718?intlink_from_url=https://www.bbc.co.uk/news/topics/cx3ezqn30pmt/india-pakistan-relations&link_location=live-reporting-story)> accessed 10 April 2020.

border(s)”<sup>137</sup> or “take steps to disrupt”<sup>138</sup> operations against India. The *Doklam* standoff is another instance where foreign aggression, in this case Chinese, was met with an equally strong response from the Indian side.<sup>139</sup>

But despite defence and national security taking centre stage, India’s military-spending is still not comparable to countries such as China, Russia and the United States. According to the Stockholm International Peace Research Institute, China has the highest increase in military spending in the past decade. It saw a rise of about 83% in China, as opposed to a mere 29% in India. In contrast, the US reduced its military spending in the past decade by about 17%, but despite this, it is still by far the largest spender in the world, spending more than twice China’s own military-budget.<sup>140</sup> As the Parliamentary Standing Committee on Defence (2017-18) noted, even Pakistan’s expenditure on defence was higher than India, at 3.3% of its GDP.<sup>141</sup>

Accordingly, China, Russia and the US are all ahead of India in the race to develop LAWS and associated technology. At the moment, India spends between 2-2.5% of its GDP on defence. Even if it were to ramp up this amount to 3% as recommended by the Standing Committee<sup>142</sup>, the difference in GDP alone with the abovementioned countries would make it difficult to

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<sup>137</sup> PTI, ‘India’s Armed Forces now do not Hesitate to Cross Border to Protect Country: Rajnath’ [2020] *The Week* <<https://www.theweek.in/news/india/2020/02/26/India-forces-now-do-not-hesitate-to-cross-border-to-protect-country-Rajnath.html>> accessed 10 April 2020.

<sup>138</sup> PTI, ‘India Took Steps to Disrupt Terror Activities, will not Hesitate to do so Again: Nirmala Sitharaman’ *The Economic Times* (20 October 2018) <<https://economictimes.indiatimes.com/news/defence/india-took-steps-to-disrupt-terror-activities-will-not-hesitate-to-do-so-again-nirmalasitharaman/articleshow/66298569.cms?from=mdr>> accessed 10 April 2020.

<sup>139</sup> Josy Joseph, ‘The Hindu Explains: From Who is Lungi Ngidi to Why U.K. Needs Minister For Loneliness, What is the Doklam Issue All About?’ *The Hindu* (27 January 2018) <<https://www.thehindu.com/news/national/what-is-the-doklam-issue-all-about/article22536937.ece>> accessed 10 April 2020.

<sup>140</sup> Matthew S. Schwartz, ‘Global Military Expenditures are up, Driven by Top 2 Spenders — U.S. And China’ (NPR) <<https://www.npr.org/2019/04/29/718144787/global-military-expenditures-up-driven-by-top-two-spenders-u-s-and-china>> accessed 10 April 2020. Matthew S. Schwartz, ‘Global Military Expenditures are up, Driven by Top 2 Spenders — U.S. And China’ (NPR) <<https://www.npr.org/2019/04/29/718144787/global-military-expenditures-up-driven-by-top-two-spenders-u-s-and-china>> accessed 10 April 2020.

<sup>141</sup> Standing Committee on Defence, ‘Demands For Grants (2018-19) | General Defence Budget, Border Roads Organisation, Indian Coast Guard, Military Engineer Services, Directorate General Defence Estates, Defence Public Sector Undertakings, Welfare Of Ex- Servicemen, Defence Pensions, Ex-Servicemen Contributory Health | Scheme (Demand Nos. 19 & 22)’ (Sixteenth Lok Sabha) Fortieth Report para 4.

<sup>142</sup> ‘Demand for Grants 2020-21 Analysis : Defence’ (PRS India, 14 February 2020) <<https://www.prsindia.org/parliamenttrack/budgets/demand-grants-2020-21-analysis-defence>> accessed 10 April 2020.

close this gap. Merely increasing and diverting funds to developing and / or acquiring LAWS in a direction-less manner would be pointless.

India might be better off utilizing the funds it has to develop and utilize LAWS in ways that are more suited to it. India simply cannot afford to expend its resources taking part in a LAWS rat-race that it mostly cannot win in any case. It can, however, rationalize and tailor LAWS development to suit it in ways that are unique to its situation.

### A. LAWS as a Solution for India's Border Woes

Apart from a shift in India's national security policy, the *Pathankot*, *Balakot* and *Doklam* incidents also highlight something crucial - that India's biggest security concerns remain at its borders, flanked by two more or less hostile nations.

India's borders are among the world's most militarized. The total length of India's international land border is 15,106.7 kms, in which the border with Pakistan is 3,323 kms long and the border with China is 3,488 kms long.<sup>143</sup> Other significant land borders include the Indo-Myanmar border which is 1,643 kms and the Indo-Bangladesh border which is 4,096.7 kms.<sup>144</sup> To guard these borders, India employs the world's largest border security force ("BSF") consisting of over 2.5 million personnel.<sup>145</sup>

However, employing huge numbers of manpower to guard long borders brings with it its own problems. Their salaries and pensions are required to be paid, which already form a significant portion of the defence budget. The Union Budget for 2020-21 saw the highest proportion of the defence budget, a whopping 30%, go towards salaries, while pensions account for 28.4%.<sup>146</sup> In contrast, capital outlay which typically includes expenditure on purchasing defence equipment, weaponry, aircrafts, naval ships, land, and construction of roads and bridges in border areas, only account for 23%.<sup>147</sup> It is obvious that revenue expenses such as salaries and pensions are causing a strain on the defence budget, with the result that capital expenditure such as modernization and procurement end up taking a backseat.

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<sup>143</sup> 'International Land Borders' <<https://mha.gov.in/sites/default/files/BMIntro-1011.pdf>> accessed 10 April 2020.

<sup>144</sup> *ibid.*

<sup>145</sup> Border Security Force, 'Press Brief-2016: BSF Raising Day' (30 November 2016) <<http://bsf.nic.in/doc/press/pr24.pdf>> accessed 10 April 2020.

<sup>146</sup> 'Demand for Grants 2020-21 Analysis : Defence' (n 143).

<sup>147</sup> *ibid.*

One reason for this is India's over-reliance on personnel. The Indian army currently has the world's largest ground force.<sup>148</sup> China, which until recently had the largest army, has massively downsized its own forces in a strong modernization push started in 2015 and has now reportedly cut its ground forces by half.<sup>149</sup>

This is where India can take advantage of the force-multiplier effect of autonomous weapons.<sup>150</sup> They can easily supplement border patrol forces such as the BSF in surveillance and detection. Larger aircraft like the MQ-1B Predator, for instance, can track terrorists and their movement.<sup>151</sup> The RQ-111 Raven, a smaller, hand-launched drone originally developed for the US military, can provide patrolling troops with reconnaissance on demand.<sup>152</sup> A deployment of several of South Korea's SGR-A1 Sentry Guard Robots would also be immensely useful in patrolling both dangerous and long borders such as the Indo-Pakistan border. Israel has used armed ground robots to patrol its Gaza border.<sup>153</sup> Such robots can be programmed to always have humans in-the-loop as well, defusing any possibility of them going rogue.

Some movement in this direction is already taking place. India is already focusing on increasing automation, if not autonomy. The Comprehensive Integrated Border Management System (CIBMS) which has been described as involving "deployment of a range of state-of-the-art surveillance technologies — thermal imagers, infra-red and laser-based intruder alarms, aerostats for aerial surveillance, unattended ground sensors that can help detect intrusion bids, radars, sonar systems to secure riverine borders, fibre-optic sensors and a command and control system that shall receive data from all surveillance devices in real time."<sup>154</sup> Two pilot projects along the Indo-Pakistan border, the Indo-Bangladesh border as well as in Jammu are reportedly operationalized.<sup>155</sup> To be clear, the CIBMS is part of the BSF's modernization

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<sup>148</sup> Snehes Alex Philip, 'Indian Army Now World's Largest Ground Force as China Halves Strength on Modernisation Push' *The Print* (17 March 2020) <<https://theprint.in/defence/indian-army-now-worlds-largest-ground-force-as-china-halves-strength-on-modernisation-push/382287/>> accessed 10 April 2020.

<sup>149</sup> *ibid.*

<sup>150</sup> Trisha Ray, 'Beyond the "Lethal" in Lethal Autonomous Weapons: Applications of LAWS in Theatres of Conflict for Middle Powers' [2018] ORF Occasional Paper No. 180 26, 4–6.

<sup>151</sup> Paul Scharre, *Army of None - Autonomous Weapons and the Future of War* (WW Norton & Company) 48.

<sup>152</sup> *ibid.* 49.

<sup>153</sup> *ibid.* 24.

<sup>154</sup> 'Union Home Minister Launches Smart Fencing on Indo-Bangladesh Border, an Effective Deterrence against Illegal Infiltration' (*Press Information Bureau, Ministry of Home Affairs, Government of India*) <<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1567516>> accessed 11 April 2020.

<sup>155</sup> *ibid.*



push in terms of *equipment* to supplement border surveillance capabilities. It should not be mistaken for autonomous weaponry such as the South Korea's SGR-A<sub>I</sub>, which the CIBMS is as yet a far cry from.

The CIBMS would continuously collect feed and transmit to BSF personnel who would, in case of threats, intervene in the form of Quick Response Teams (QRTs) and neutralize them.<sup>156</sup> Although the CIBMS primarily envisages the use of detection and surveillance equipment such as sensors and satellite imagery, the use of drones and other unmanned aerial vehicles will also be considered.<sup>157</sup>

Proper implementation of the CIBMS involving the use of both automated and autonomous solutions would greatly alleviate India's border woes. Of course, given the current level of technology, AI and other technological solutions can only be a force-multiplier and not completely displace the foot soldier. But it would still go a long way towards reducing India's human resource problems and budgetary constraints. BSF soldiers work in harsh conditions. The Department-Related Parliamentary Standing Committee on Home Affairs has also noted and expressed its anguish that basic amenities are often not provided to the BSF jawans under a system that does not permit them to get sufficient rest on account of manpower shortages.<sup>158</sup> This results in ever-increasing numbers of BSF personnel, also pushing up salaries and pensions, both exacerbating the defence budget's revenue to capital ratio as well as delaying modernization efforts. Technology can off-set this somewhat.

A cautious approach to the development and use of LAWS in sync with its own unique needs would also synchronize with India's approach to civilian AI. In this regard, the NITI Aayog has recently argued for taking an approach to AI that was inclusive, sustainable and tailored to India's unique needs. Although only dealing with civilian application of AI, the discussion paper titled "National Strategy for Artificial Intelligence #AIFORALL" has identified sectors that AI growth in India should focus on - healthcare, agriculture, education, smart cities and infrastructure as well as smart mobility and transportation. The document is underpinned by a philosophy of "AI for

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<sup>156</sup> R.K. Arora, 'Can CIBMS Alone Secure the India's Borders?' *The Economic Times* (7 September 2018) <<https://economictimes.indiatimes.com/news/defence/can-cibms-alone-secure-the-indias-borders/articleshow/65722529.cms?from=mdr>> accessed 11 April 2020.

<sup>157</sup> Department-Related Parliamentary Standing Committee on Home Affairs, 'Border Security: Capacity Building and Institutions' (Parliament of India (Rajya Sabha) 2017) 203 13 <[http://164.100.47.5/committee\\_web/ReportFile/15/15/203\\_2017\\_4\\_11.pdf](http://164.100.47.5/committee_web/ReportFile/15/15/203_2017_4_11.pdf)> accessed 11 April 2020.

<sup>158</sup> *ibid* 14–15.

the Greater Good” which ensures social and inclusive growth. Given India’s large digital divide and social inequities, this is important.

## VII. CONCLUSION

Autonomous weaponry, whether lethal or not, is inevitable. The authors of *Losing Humanity* are to be credited for strongly bringing to the fore several innate issues with autonomous weaponry, both in of itself as well as its use, but in a world of international law that is constantly shaped by real-politik, their arguments about its inherent illegality, while compelling from an ethical point of view, do not hold much legal merit. Of course, this also does not mean that the world is definitely heading towards a Terminator-like dystopian scenario. States will continue to be guided and constrained in their development and use of these weapons by international humanitarian law.

The difficulties in applying IHL as detailed in this paper will no doubt be hard to overcome. But this is not the first time existing law is being interpreted to accommodate new and possibly unfathomable technologies, as the International Court of Justice also noted in the famous *Advisory Opinion on Nuclear Weapons* case.

A positive development is how States are already seriously considering these issues and expressing their views. Although autonomous weaponry is already in use by States, it is employed only by a handful of them and even these States have not advanced irrevocably down the autonomy line. Hence, the law may not be too far behind technology in this field, and the legal principles that evolve from these ongoing discussions can help both inform and direct the growth of autonomous weaponry. That is the ultimate goal of the inter-governmental discussions on autonomous weaponry.

Meanwhile, arguments for and against autonomous weapons will continue to be raised even as technology reaches new levels of automation and autonomy and not all of these arguments will be purely legal. Some of the strongest arguments raised against autonomous weapons and that their advocates find themselves forced to defend are ethical, or even philosophical. Is it morally right to allow a machine to decide whether or not to kill a human being? This question gains all the more importance given views like those of *Sharkey’s*, that technology will never advance to the point where a machine can feel as a human does. *Paul Scharre* takes this question out of the realm of hypotheticals and moral conjecturing into the real world to show us the stark consequences. In his book *Army of None - Autonomous Weapons and the Future of War*, he writes of his experience as a US Navy

Seal in Afghanistan and how he and his team had faced a young girl of around 6 years old who, under the pretext of herding cattle, was actually keeping a watch for the Taliban insurgents and had possibly even signalled to the Taliban of *Scharre's* team's presence in the area.<sup>159</sup> Scharre goes on to note in his book that while she was a lawful target under IHL, the question of shooting a child in such a situation had not even come up in his team.<sup>160</sup> But he wonders whether a machine would have made the same choice, or whether, based on the danger the girl presented, the machine would have chosen to eliminate her.<sup>161</sup> It is telling that the answer can never be in the realm of certainty.

On the other hand, advocates of autonomous weapons, unfazed by these arguments, present their own compelling reasons. A robot does not rape, they say.<sup>162</sup> A robot also does not pillage or succumb to fear or frenzy in the way humans in the heat of war can. They would also be correct. As one scholar noted, "only humans can be inhuman and only human beings can deliberately choose not to comply with the rules they were instructed to follow."<sup>163</sup> Arriving at the right answer in the face of these arguments is incredibly difficult. We have not attempted to address these issues in this paper, for reasons concerning both expertise and space constraints, since these complex issues deserve dedicated attention. But they are certainly important and merit in-depth examination.

Both cyber power and weaponization of AI are changing the face of modern warfare.<sup>164</sup> With regard to India's role in the larger scheme of autonomous weaponry, her active participation in the Group of Governmental Experts is heartening. But any claims of her playing a major leading role would, for the foreseeable future, be exaggerated. India is already lagging behind the United States and China, in defence expenditure and more importantly, defence modernization.

Aside from defence technology, India is currently not among the main competitors even in the AI race, unlike China which is going head to head

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<sup>159</sup> Scharre (n 152) 21.

<sup>160</sup> *ibid.*

<sup>161</sup> *ibid.*

<sup>162</sup> Christof Heyns, 'Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions' (UN Human Rights Council 2013) A/HRC/23/47 para 54 <<https://www.refworld.org/docid/51a747c54.html>> accessed 1 June 2020.

<sup>163</sup> Marco Sassoli, 'Autonomous Weapons and International Humanitarian Law: Advantages, Open Technical Questions and Legal Issues to Be Clarified' (2014) 90 *International Law Studies* 310.

<sup>164</sup> Ajay Lele, 'Debating Lethal Autonomous Weapon Systems' (2019) 13 *Journal of Defence Studies* 66.

with the United States in terms of research and the number of publications on AI in scientific journals.<sup>165</sup> Defence experts have also expressed the view that there is a “void in terms of doctrines and perspective plans when it comes to exploitation of AI / robotics technologies.”<sup>166</sup> The Defence Research and Development Organization, the government’s premier agency for military research and development is also viewed as inadequate and unlikely to produce timely and meaningful results.<sup>167</sup> The CIBMS scheme is a step in the right direction as regards modernization for India’s defence, but slow and unwieldy procurement processes hinder rapid progress.

Also, while the government is making it evident that they are conscious of these issues, efforts do not appear to be enough. The report of the Defence Ministry sanctioned Task Force which was commissioned to “study the whole gamut of issues surrounding strategic implications of AI in national security perspective, in global context” was not disclosed to the public, even though the transparency and multi-stakeholder consultation would have benefitted the government.<sup>168</sup>

It is also evident that given the difference in situations, India would be better off using LAWS as a force multiplier rather than seek to develop offensive capabilities that are not suited to its unique needs. Even this will require India to take several steps first, such as developing doctrinal and conceptual determinations of AI application, field trials, impact examination and so on.<sup>169</sup> At the same time, India would be well-advised to continue playing an active role in LAWS at international forums, since it can ensure its interests are not ignored in the development of the law around LAWS. Similar to several other global fora, the GGE on LAWS is also pervaded by inequalities and a tension between the developed countries such as the United States, the United Kingdom and Russia arguing against a ban, having the resources and the expertise to pursue advancements in autonomous weaponry, and the developing or least developed countries, who find themselves having to argue

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<sup>165</sup> “Scimago Journal and Country Rank”, <<http://www.scimagojr.com/countryrank.php?category=1702&area=1700>>, accessed on 17 February 2018.

<sup>166</sup> R.S. Panwar, ‘Artificial Intelligence in Military Operations: Technology, Ethics and the Indian Perspective’ (*Manohar Parrikar Institute for Defence Studies and Analyses*, 31 January 2018) <[https://idsa.in/idsacomments/artificial-intelligence-in-military-operations-india\\_rspanwar\\_310118](https://idsa.in/idsacomments/artificial-intelligence-in-military-operations-india_rspanwar_310118)> accessed 4 June 2020.

<sup>167</sup> *ibid.*

<sup>168</sup> Press Information Bureau, *AI Task Force Hands over Final Report to RM* <[pib.gov.in/Pressreleaseshare.aspx?PRID=1537260](http://pib.gov.in/Pressreleaseshare.aspx?PRID=1537260)> accessed 4 February 2020.

<sup>169</sup> Narender Kumar, ‘India Needs AI to Secure Itself’ (*DNA*, 30 May 2018) <<https://www.dnaindia.com/analysis/column-india-needs-ai-to-secure-itself-2620058>> accessed 4 June 2020.

for a ban in an attempt to keep the playing field level.<sup>170</sup> This is something India will have to navigate.

On the whole, it seems likely that the dust around the issue of autonomous weapons is not going to settle for a while yet. This is because no matter how much the law can try and regulate its growth, discussions around their legality will continue to be at least partly in the realm of conjecture until LAWS are actually put to use and the consequences become evident. The aim of this paper is to illustrate or highlight the main legal issues in this important debate on autonomous weaponry, an essential task given the scarcity of academic opinion on the subject from Indian scholars.

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<sup>170</sup> Trisha Ray, 'The Need for African Centrality in the Lethal Autonomous Weapons Debate | ORF' (ORF | Expert Speak, 8 April 2019) <<https://www.orfonline.org/expert-speak/the-need-for-african-centrality-in-the-lethal-autonomous-weapons-debate-49695/>> accessed 4 June 2020.