Armed drones and international humanitarian law

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Abstract

The militarisation of Artificial Intelligence Diplomacy has resulted in the development of heavy weapons that are more powerful than traditional weaponry, fail to distinguish between civilians and combatants, and cause unnecessary suffering. Superpowers and middle powers have made significant investments in digital technologies, resulting in the production of digital weapons that violate international humanitarian law and human rights standards, and complicate the achievement of global peace. Armed drones and militarised robots cause unnecessary pain and suffering to helpless civilians. These weapons have been used to combat terrorism, but, surprisingly, have not addressed issues of terrorism that affect post-Cold War international relations. As a result, the use of armed drones is causing more harm than is necessary to achieve the objective of war. There is a call for international artificial intelligence (AI) governance, as well as a need to understand the effects and serious threats that armed drones pose to international humanitarian law (IHL), as well as to peace processes in international relations and global cooperation. Scholars, policy-makers, human rights activists and peace practitioners should participate more actively in debates about the military application of AI diplomacy, in order to develop effective AI diplomacy rules and regulations. This serves to mitigate the risks and threats associated with armed drones on IHL and international human rights standards, which are the foundations of the post-modern world.

Keywords: 4IR, Artificial Intelligence diplomacy, Warfare, International relations, International humanitarian law, Armed Drones

1 Introduction

The digital age, or Fourth Industrial Revolution (4IR), has also ushered in the artificial intelligence (AI) revolution, with significant and growing impacts on the contemporary world. The rise of AI brings with it enormous opportunities, but also unpredictable and difficult-to-manage threats to peace processes. The Russian president, Vladimir Putin, has stated openly that whoever becomes the leader in this field will become the ruler of the world (RT News 2017). AI and its sister technologies (blockchain, big data, internet of things, and 3D technologies, among others) power 4IR in the conduct of modern international relations between states (Wan 2018). Digital technologies have been relentless in capturing people's attention, but we are still unsure about the full impact of AI diplomacy on the future of warfare and peace processes. Clancy (2016) submits that the conduct of armed conflicts in post-modern militaries has involved hybrid warfare, which combines traditional battle elements associated with non-state actors with digital weapons such as armed drones.

AI and its sister technologies have environmental, social, physical, political and security implications, worsening existing threats while introducing new threats and changing the character and nature of modern warfare (Mallick 2017). These changes include social engineering attack automation, vulnerability discovery, influence campaigns, terrorist repurposing of commercial AI systems, increased attack scale, and information availability manipulation (ibid). While contemporary technology is only the beginning of a promising future, many academics and AI practitioners believe that military technology will eventually lead to fully automated armed robots (ibid). The use of AI diplomacy in modern-day warfare has resulted in a significant shift from the 'human' role in warfare towards autonomous digital technology (Clancy 2016). The application of AI diplomacy in the field of military research, as well as the development of autonomous weaponry, has created new forms of uncertainty in respect of peace processes, thereby complicating the maintenance of international peace and security.

The use of automated, non-humanoid robots in warfare could jeopardise the protection of human rights. Scholars have maintained that while robots provide many benefits to humanity, their use in the form of military drones provides cause for serious public concern (Sharkey 2008), and many experts and robotic scientists are calling for them to be classified as killer robots and banned from military warfare altogether (Open Letter 2015, 2017). While the first and second revolutions in warfare were triggered by gunpowder and the development of nuclear weapons respectively (Altmann and Sauer 2017), robotic warfare has ushered in the third and most lethal revolution to date (Open Letter 2017). Robotic warfare poses a grim threat to the observance and implementation of International Humanitarian Law (IHL), and complicates the conduct of peace processes.

According to Ancelin (2016), the application of AI to military operations and weaponry endangers people's lives as well as international peace and security in general. If, one day, digital technologies come to decide the fate of human beings on their own, this will redefine the very nature of warfare as we know it. There are extensive debates in the literature about the use of lethal autonomous systems in warfare, with some scholars supporting it and others advancing opposing arguments (Larkin 2011; Tonkens 2012; Goodman 2014; Sterio 2012). All these debates demonstrate a high level of concern about the use of digital technologies and/or lethal autonomous weapon systems in warfare, necessitating the need for sound and binding rules and regulations in this regard. These autonomous weapons make use of armed drones, also known as Armed Unmanned Aerial Vehicles (AUAVs) and robotic warfare, necessitating laws and regulations to control their use and impacts during military engagement or warfare. In order for these regulations to be effective, ways of restricting their capacities should be considered. This will allow more efficient monitoring. Unlimited capacities for destruction are a cause for great concern, and weapons with such capacities may be difficult to contain once they have been automated.

However, rather than focusing on the laws that govern the use of autonomous weapons during warfare, the purpose of this study is to determine whether the use of these weapons in warfare violates existing laws on armed conflicts. This includes the principles of *jus in bello*, or 'the just conduct of war', namely the distinction between civilians and combatants; the prohibition against attacking those *hors de combat*; the prohibition against inflicting unnecessary suffering; the principle of necessity; and the principle of proportionality). This study does not assess the effects of armed drones on all these principles, but focuses instead on the prohibition of attacking those who are not armed and the use of excessive force; the need to distinguish between civilians and combatants; and the prohibition on inflicting

unnecessary suffering. While numerous studies have been conducted on the application of AI technology to military activity and warfare, fewer studies have been conducted to determine whether contemporary armed drones adhere to IHL and the laws of armed conflicts. As a result, the question that arises is whether the present use of armed drones accords with IHL, or the laws of armed conflict.

Therefore, this study seeks to answer the following research question: Does the use of armed drones conform to the laws of armed conflicts and IHL that require the protection of civilians or innocent people? Therefore, its purpose is to investigate the effects of the use of armed drones on the observance of IHL.

The study is divided into six sections. The first section provided an introduction. The second defines the key concepts that will be used in the course of this study. The third offers a brief explanation of the basic principles of IHL. The fourth describes the research methodology, including methods used for gathering and interpreting data. The fourth section contains a literature review on the use of armed drones in warfare, aimed at determining whether they involve perceived or real threats to humanity. This section also explains the types of armed drones used in modern warfare. The fifth section explains the effects of armed drones on the IHL. The sixth section consists of a conclusion and offers recommendations for regulating the use of armed drones during armed conflicts.

2 Definitions of terms

2.1 Peace process

Contemporary peace process also entails the use of digital technologies to either halt armed conflicts, or assist the combatants to reach a negotiated settlement. Because diplomacy can continue while warfare is ongoing, the peace process can also refer to the conduct of warfare using digital warfare technologies. Berridge and James (2003) define the peace process as 'a popular synonym for negotiation or diplomacy aimed at the resolution of a major conflict'. The concept of a 'peace process' has been applied to much longer and less promising negotiations, more in the hope of achieving peace than on the basis of genuine progress in that direction (ibid. However, while the concept of the 'peace process' is well-intended, its use is ill-advised because it may lead to a bogus belief that peace is being made or reached when it is not.

2.2 AI diplomacy

The notion of AI diplomacy combines two concepts, namely AI and diplomacy. Therefore, it implies diplomacy conducted or practised through the use of AI technologies. Diplomacy has a long history as a process of communication and negotiation during times of disagreement or tension. It has existed as long as political entities have competed with one another, and has been characterised by constant change. Put differently, the notion of diplomacy has been adapted to various political environments and situations while maintaining its significance (Neumann 2015). According to Kļaviņš (2021:124), 'old sites of diplomacy have assumed new characteristics, while new sites are physically and virtually emerging'. AI is transforming the concept of diplomacy and is causing fundamental shifts in both theory and practice, as well as the nature of inter-state competition (ibid. However, because AI provides governments with long-term competitive advantages, rivalry encourages states and other political actors to use diplomatic capabilities to achieve their objectives (Shapiro and Rakov 2020).

As AI-powered technologies reshuffle winners and losers in global markets, thereby affecting the balance of power, it is unsurprising that digital technologies are becoming a focal point for diplomats and diplomatic institutions in today's digital society (Kļaviņš 2021:124). According to Scott, Heumann and Lorenz (2018:7), these technologies intersect with conventional foreign policy issues in fundamental ways. At the highest level, there is the impact on the global power balance. The potential for AI to advance national economic and security interests has sparked fierce competition among governments to gain a strategic advantage; simply establishing a special office for AI will not suffice (Scott, Heumann & Lorenz 2018:7).

AI is a nebulous term, not least because its definition has evolved over time. According to Franke (2021:9-10), AI refers to 'efforts to build computers and machines capable of performing actions that one would expect to require human intelligence'. Weisgerber (2017) suggests that AI is any artificial system that can learn from experience and improve performance when exposed to datasets, or that can perform tasks under varying and unpredictable conditions without significant human oversight. Konerta and Balcerzak (2021:293) submit that AI is an artificial system 'designed to think or act like a human, including cognitive architectures and neural networks'. To that end, AI is designed to act rationally through the aid of an intelligent software agent or embodied robot that achieves goals through 'perception, planning, reasoning, learning, communicating, decision-making, and acting' (ibid).

According to Buchanan and Miller (2017), once something works, we no longer refer to it as AI but as software. Despite ongoing discussions about possible superintelligence, today's AI applications are narrow, in the sense that they have mastered a single task; and brittle, in the sense that they fail when confronted with tasks that differ slightly from its training (Buchanan and Miller 2017). Franke (2021:9-10), argues that Artificial General Intelligence (AGI), meant to be capable of reproducing human-level intelligence across various tasks, remains in the realm of science fiction, and considerable disagreement exists among experts about the possibility of AGI actually emerging, and when it will emerge (ibid).

While Clark (2019) refers to AI as 'omni-use' or general-purpose technology, Bai (2019) and Vincent (2018) argue that it can be used in a variety of ways, including assisting healthcare workers to interpret X-ray readings, making warehouses run more efficiently, enabling military systems, and supporting data analysis. Given the breadth of applications of AI, Franke (2021:10-11) posits that it is 'preferable to think of AI not as a single technology, but as an enabler' which fosters AI-enabled systems. AI is widely grouped with other emerging digital technologies such as 5G, quantum computing, biotechnology, cyber, blockchain, and many others. Franke contends that it would be difficult to keep these apart, as they 'interact and feed off each other'. 5G helps connect AI-enabled devices, quantum computing could make AI significantly more powerful, and AI could enable biotechnology research (ibid). Machine learning techniques, particularly deep learning and neural networks, are currently making the most significant advances in AI (ibid). For example, it has been argued that machine learning systems use computing power to execute algorithms that learn from data (Buchanan 2020).

2.3 International humanitarian law

IHL, also known as the law of armed conflicts, is a major component of public international law. It consists of laws and rules aimed at protecting people who are not or are no longer involved in armed conflicts, as well as limiting the methods and means of warfare used (ICRC 2002). According to the International Committee of the Red Cross (ICRC), IHL is an international treaty or set of customary rules ratified to resolve humanitarian issues arising directly from armed conflicts. Whether the nature of the conflict is international or non-

international, humanitarian laws are used to restrict the use of heavy lethal weapons, and protect people and property from the effects of warfare (ibid). In the case of open armed conflicts, humanitarian law is almost always more detailed and comprehensive than human rights law (ICJ Reports 1996:226). The International Court of Justice (ICJ) has stated that 'humanitarian law has evolved highly detailed and technical provisions to govern soldiers' and civilians' conduct in such situations, and it continues to be the primary body of law applicable in all situations of armed conflict' (ibid).

Humanitarian law requires all parties to an armed conflict to distinguish between civilians who are not fighting and combatants who are fighting, and to protect the property of civilians at all times. The ICRC (2002) has maintained that neither civilians nor individual property may be attacked during times of armed conflict. IHL does not end warfare; rather, it mandates combatants to follow the rules that protect civilians and their property. That is, any military attacks should not be directed at civilians, but rather at combatants. IHL maintains that any combatant who has ceased fighting and no longer participates in armed conflicts must be spared and protected. The ICRC also dictates that those special people who are not participating in the warfare must be protected with mercy and empathy, and must be treated with humanity without discrimination.

IHL further requires that if a combatant is injured or sick and no longer poses a threat, he or she must be protected, collected, and cared for by the party to the conflict that has control over them (ibid). Furthermore, the same law protects belligerents who have surrendered and are no longer involved in the armed conflict. The law also prohibits the use of sophisticated weapons and any other means that are likely to result in unneeded losses or excessive suffering. During an open armed conflict, medical personnel, establishments, transports, and equipment must also be protected from harm or attack (ibid).

3 The Basic Principles of IHL

The core principles of IHL are:

- The distinction between civilians and combatants;
- The prohibition against attacking those hors de combat (that is, those who are not directly engaged in or participating in hostilities);
- The prohibition against inflicting unnecessary suffering;
- The principle of necessity; and
- The principle of proportionality (ICRC 2004).

In terms of its objectives, underlying principles, and related challenges, IHL is both simple and complex. David (2002:921-922) explains:

> To put things as simply as possible, these rules can be summed up in four precepts: do not attack non-combatants, attack combatants only by legal means, treat persons in your power humanely, and protect the victims ... At the same time, the law of armed conflicts is complex since it does apply only in certain situations, those situations are not always easily definable in concrete terms and, depending on the situation, one and the same act can be lawful or unlawful, not merely unlawful but a criminal offence, or neither lawful nor unlawful.

In summary, the purpose of IHL is to:

- Minimise the suffering, loss, and damage caused by armed conflict to the greatest extent possible;
- protect people who are not directly involved in the conflict, such as the wounded, sick, and shipwrecked; people deprived of their liberty, such as prisoners of war (PW), retained personnel, internees and detainees; as well as civilians; and
- facilitate the restoration of peace.

However, IHL does not oblige or request combatants to stop fighting each other; or stop people from suffering during times of war.

The intentions of IHL are to permit armed conflicts, provided the combatants promise to adhere to the law of armed conflicts and allow humanitarian efforts to take place during the fighting with the aim of ensuring that the adverse effects of warfare are kept to a minimum. IHL protects those who have ceased fighting and those who are not engaged in combat, and manages conflicts by limiting the means and methods of warfare, as well as military tactics permissible (ICRC 2004). IHL forbids the use of any means or methods of warfare that:

- fail to distinguish between those who are fighting and those who are not, such as civilians, with the goal of protecting the civilian population, individual civilians, and civilian property;
- cause superfluous injury or unnecessary suffering; or
- cause severe or long-term damage to the environment (ibid).

IHL has banned the use of sophisticated weapons such as exploding bullets, chemical and biological weapons, blinding laser weapons and anti-personnel mines (ibid).

'Armed drone', 'combat drone', or 'AUAV' are terms that refer 'to a remotely operated unmanned aircraft or robot that is colloquially referred to as a "drone" and which is often used in modern day state-to-state warfare' (Meltzer 2013:7). The concept is made up of two terms, namely armed and drone. The term 'drone' is traditionally understood as the humming sound made by a male honeybee while flying. As a result of the similarity between the sound of a flying drone and that of a flying bee, the term 'drone' was coined to refer to AUAVs (Uddin 2020). According to Meltzer (ibid), a AUAV is an 'unmanned aircraft or ship guided by remote control or on-board computers'. It is a flying robot that can be controlled remotely or autonomously using software-controlled flight plans in their embedded systems in conjunction with on-board sensors and GPS. Unmanned aerial vehicles (UAVs) or drones are aircrafts that do not have a crew or passengers on board. They can either be automated drones or remotely piloted vehicles (Uddin 2020).

4 Methodology

Qualitative data was gathered and analysed in order to aid an understanding of the effects of armed drones on IHL. 'Qualitative research investigates how people make sense of their own concrete, real-life experiences in their own minds and in their own words' (Woodman 2014: 465). Qualitative research is a type of 'social action that focuses on how people interpret and make sense of their experiences in order to understand individuals' social realities' (Haradhan 2018:2). The paper's goal of understanding people's reactions to distressing situations, and

how they interpret their experiences in order to construct meaning, made qualitative research appropriate for this study (Brink 1993:37).

The paper seeks to comprehend people's perspectives and experiences, as well as how they interpret the world around them in order to construct the foundation of their interactions. Both analytical and exploratory approaches were employed, aimed at 'explaining how and why a specific social phenomenon or program operates as it does in a specific context' (Woodman 2014: 465), and to 'understand the social world in which people live, the experiences they have, and why things are done the way they are done' (Polkinghorne 2005:140).

This method allowed the study to describe and explore the effects of armed drones on IHL, international relations and global cooperation. It enabled the presentation of an in-depth analysis of the use of armed drones in modern warfare, as well as the effects of the use of digital technologies, particularly drones, in modern-day warfare. The effects of these digital technologies on IHL, as well as their impact on peace processes and the maintenance of international peace and security are also investigated. The methodology was also influenced by the anti-positivist ontological paradigm. The subjectivist epistemological approach adopted in this study aided in the analysis of AI diplomacy and peace processes, as well as the effects of armed drones on IHL in global politics. This provided an in-depth understanding of how modern warfare is conducted, the weapons used, and how armed drone weapons violate armed conflict laws, thereby posing serious threats to peace.

5 Literature Review

The end of the Cold War resulted in massive changes in the nature of wars as well as international relations. Warfare shifted from interstate to intrastate conflicts, as mostly third-world countries began to face deadly civil wars, also known as inter-communal conflicts. Furthermore, since 9/11, the world has witnessed the rise and spread of terrorism and terror groups in various regions, significantly altering the nature of wars. The shifts in international relations have also complicated the means by which armed conflicts are fought. International relations have featured the existence of internal conflicts as well as international conflicts involving more than two states. They have also been defined by the US-led 'war on terror', which has resulted in numerous conflicts that have become international in nature.

These developments have prompted the development and use of new and more sophisticated weapons, including digital weapons used from afar. The use of advanced technology in the conduct of armed conflicts and the fight against terrorist groups has shaped global stability, and has had a direct impact on peace and stability in third-world countries. AI is at the heart of advanced technology, and plays a vital role in the conduct of modern wars. It is important to recognise that AI is at the epicentre of modern-day wars against terror, and influences state-to-state relations.

That being said, the use of armed drones in warfare has sparked numerous international relations debates. These centre on whether armed drones or non-human objects used in warfare violate or follow the principles and laws of war as codified in the 1949 Geneva Conventions. AI has evolved into a tool of power politics and a component of state diplomacy, and it is increasingly being used by rich and powerful states to conduct international warfare. The militarisation of AI diplomacy has a massive impact on global politics and peace processes, particularly in the global South. Strategists and military advisers frequently assert that the

militarisation of AI is unstoppable (Kolton 2016). The application of AI to military activity is reshaping the character of international security (Brose 2019:128).

According to Buchanan (2020), the triad of data, talent (to develop algorithms), and computing power are vital inputs for AI. Technology has transformed economies and societies throughout history, redistributed (military) power among states, and empowered new actors (Franke 2021). It has been claimed that the militarisation of AI impacts on the conduct of wars and the global laws of war enshrined in the IHL conventions. AI is frequently grouped with other emerging technologies such as 5G, quantum computing, biotechnology, and cyber (ibid:13). It can be difficult to separate these technologies because they interact with and feed off of one another. 5G helps to connect AI-enabled devices, quantum computing could make AI significantly more powerful, and AI could enable biotechnology research, as well as cryptocurrency (ibid).

The application of AI in warfare extends far beyond gun-toting androids (Garcia 2019:3). Their use in warfare has surpassed human capabilities, 'unsettling all five domains of warfare (land, sea, air, outer space, and cyberspace), as well as multiple dimensions pertaining to command, control, communications, computers, intelligence, surveillance, and reconnaissance' (ibid). The United States has launched a drone strike against al-Qaeda and defended American troops from drone attacks in Afghanistan, Iraq, Israel, Yemen, Libya, Mali, Pakistan, the Philippines, Somalia, and Syria for example (Reisner 2019:69-70). The US has also conducted special operations raids against ISIS. If this is what not being at war looks like, it is difficult to imagine global peace in the modern world.

6 AI Diplomacy in Military Defence

AI militarisation has become a feature of military defence against external forces. It is reshaping military warfare, and today, military command and control are centred on digital technologies. It has been argued that the use of AI diplomacy in warfare aids in the linking and fusion of information from various sensors, resulting in a single source of information (US Congressional Research Service 2020). (Franke 2021: 24-25) also remarks that AI diplomacy in warfare enables the discovery of alternative means of disseminating information even when military communication links are severed It can also support joint military operations, particularly those involving multiple armed forces, such as NATO or EU operations in Libya. The Defense Advanced Research Projects Agency's Mosaic Warfare program (DARPA) is an example of this, as it coordinates autonomous forces and generates multi-domain command and control nodes, resulting in a mosaic battle plan (Hitchens 2021). During military warfare or military operations, AI diplomacy is presented as 'capable of providing commanders with a menu of possible courses of action based on real-time analysis of all available information, potentially improving the quality and speed of decision making' (Franke 2021:26; DARPA 2019).

According to the UNIDIR (2018), more intelligent machines are taking on more difficult tasks in more complex environments that humans cannot handle. Because digital devices are faster than humans at analysing data, making major decisions, and conducting warfare operations, the use of AI diplomacy allows militaries to explore their autonomy. AI diplomacy enables military autonomous drones to fly to specific locations, conduct operations, and kill without the assistance of a remote human operator (Konerta and Balcerzak 2022:293). Autonomy has been made possible by AI diplomacy, which has been 'particularly appealing for defensive systems, such as those that provide protection against rockets or missiles' (Franke 2021: 26).

It is argued that AI diplomacy in warfare provides 'unmanned systems with more autonomy can also help to make them stealthier, as autonomous systems do not need communications uplinks or downlinks to an operator, making them harder for enemy defences to detect' (ibid). Importantly, autonomous systems in warfare will generally reduce and/or eliminate militaries' reliance on humans. While the use of AI diplomacy in warfare can reduce human dependence, human error, and costs, as well as alleviate physical or cognitive strain on soldiers, it can also go beyond/out of technology control, wreaking havoc on the world. This argument is supported by Altmann and Sauer (2017), who argue that AI diplomacy used in warfare has advantages, but also carries deadly risks.

7 AI Diplomacy in Warfare

Armed drones have been used in warfare all over the world. It is estimated that nearly 100 countries use military drones (Karyoti 2021). They are equipped with the latest-generation cameras, provide accurate topographies, and are used in combat and rescue missions (Konerta and Tomasz 2021:294). Armed drones with AI technologies communicate with soldiers on a continuous basis and provide them with information about enemy movements (ibid). Azerbaijan used armed drones to gain a significant advantage over Armenia in recent fighting for control of the Nagorno-Karabakh region (ibid). In 2021, the Israeli Defence Forces allegedly used drones to drop tear gas on protesters in the occupied West Bank, while Hamas launched loitering munitions-carrying drones into Israel (Hernandez 2021).

Furthermore, Mizokami (2021) claimed that during the Second Libyan Civil War, Libyan forces used Turkish-made drones to track and jam retreating enemy forces, preventing them from using their own drones. The US in particular has extensively used drones to kill militants and destroy physical targets (Hernandez 2021). It is also stated that 'since the 1950s, the US Department of Defense has used drones in nearly every military operation to provide reconnaissance, surveillance, and intelligence for enemy forces' (Konerta and Tomasz 2021:294). As digital technology advances, many states continue to use AI to develop more sophisticated swarms of armed drones made possible by the Chinese Electronics Technology Group's swarm technology (Liu 2018:61-67). Drone swarms are being researched in the US (Konaev 2019), Russia (Bendett, 2021), India, and China (Trevithick 2020). Spain, Italy, and the United Kingdom, among others, are investigating swarms for their armed forces (Boguslavsky 2021). Swarm research was also supported by the EU's Horizon 2020 funding, specifically 'Roborder' – an 'autonomous border surveillance system with unmanned mobile robots including aerial, water surface, underwater, and ground vehicles, capable of functioning both as standalone and in swarms' (Franke 2021: 27).

It has been claimed that 'AI diplomacy is being integrated into nuclear weapons, such as AI-enabled nuclear defense automation or AI-enabled autonomous systems carrying nuclear weapons' (Lowther and McGiffin 2019). Because nuclear weapons pose such grave dangers, attempts have been made to integrate them with AI technologies. According to Favaro (2021), AI diplomacy has the potential to have an indirect impact on nuclear deterrence and the global nuclear order, and can also lead to disinformation, undermining trust and confidence in intelligence received by political leaders. Favaro goes on to argue that AI technologies can have an impact on military decision-makers because their intelligence-gathering methods are compromised, resulting in them striking blindly and putting the entire operation in jeopardy.

Moreover, there have been discussions about whether the use of AI technologies in warfare has the potential to undermine states' second-strike capability (Boulanin et al 2020). It is argued, for

example, that the use of AI technologies in warfare can make the oceans transparent through the use of sensors and AI-enabled data analysis, undermining maritime deterrence (ibid). As a result, coastal states may be rendered defenceless against external attacks. Similarly, applying AI technologies in warfare has the potential to improve defence against nuclear attack while also undermining the current nuclear deterrence system (Franke 2021:27). While the use of armed drones resulting from digital technologies may improve the international security architecture, it may also weaken its foundations, leading to a world of chaos in which robots have more value than humans. According to Boulanin et al (2020), applying AI diplomacy to warfare may increase surveillance, which in turn may help improve information availability. It will also improve early warning detective systems, lowering the risk of erroneous decisions (ibid). It may also improve and provide digital technology monitoring and verification of nuclear arms control regimes (ibid).

Hezbollah, for example, is said to have used UAVs equipped with explosives to attack Israeli targets in 2006, as well as to spy on Israeli nuclear facilities and probe Israeli defences (*The Independent* 2012). It is said to have a fleet of 200 unmanned aerial vehicles, or UAVs (YNet News 2013). Similarly, Iraqi insurgents are said to have planned to outfit UAVs with chemical weapons (BBC 2013). The Syrian regime has used Iranian UAVs to track insurgents in densely populated areas and to monitor targets (Zwijnenburg and Van Hoorn 2015).

8 Types of Armed Drones

Different types of armed drones are used in warfare. They include UAVs and unmanned robots.

8.1 Unmanned aerial vehicles

Meltzer (2013:7) states that the use of armed drones in military warfare can be traced back to World War II and beyond, 'becoming increasingly significant in the course of the second half of the 20th century'. The US Department of Defense (2011:21) reports that 'military drones were used primarily for aerial surveillance' and their functions gradually expanded to areas such as 'search and rescue, communications systems relay, suppression of hostile air defense, and direct attacks against selected targets'. Meltzer (2013:7) adds that the use of armed drones 'has increased since the Second Intifada in the Israeli-occupied areas (from the year 2000), continuing in the Second Gulf War (2003-2011)'.

The use of armed drones reached its peak in the course of the US combat with Al-Qaeda and 'affiliate groups in Afghanistan, Pakistan, Yemen and Somalia (from the year 2001)' (ibid). Melzer (2013:8) also notes that the 'usual and current use of armed drones is for the targeted killing of pre-identified individuals in the territories of other states'. The US Department of Defense (2011:22) reports that 'by 2012, the US disposed of some 7 000 drones flying roughly 20,000 sorties per year, with a total of 1 million armed hours achieved already in 2010'. Melzer estimates that, between 2004 and 2012, drones operated by the CIA 'carried out approximately 350 attacks in Pakistan alone, killing between 2 000 and 3 000 individuals' (2011:22).

While some states, such as Israel, the UK, Australia and Germany are already known to have conducted or contributed to armed drone attacks (Alston 2011:436), others including Russia, Turkey, China, India, Iran, and France, are reported either to have or to be seeking to 'acquire drones capable of being armed with laser-guided missiles' (ibid: 27). He asserts that drone technology has spread all over the world, has been obtained by many states, groups and

individuals, and is being used by non-state armed groups. For example, Hezbollah claimed responsibility 'for the launch of an Iranian manufactured Shahed-129 reconnaissance and armed drone' which was shot down by Israel after flying 25 miles into its territory (Melzer 2013:8).

8.2 Armed robot drones

Armed robot drones, also known as military robotics, have been used in warfare and are known to be deadly. Armed robot drones can be categorised as either ground, aerial, or maritime (Sapaty 2015).

Aerial robotics

A number of aerial robotics aircraft known as UAVs have been developed by the US Army, Air Force and Navy. These aerial robotics can be used for reconnaissance without endangering human pilots, and can also be used to carry missiles and other weapons of warfare (Lin, Bekey & Abney 2008). The aerial robotics aircraft that is best known is the semi-autonomous Predator Unmanned Combat Air Vehicles (UCAV)' built by General Atomics which can be equipped with Hellfire missiles (Sapaty 2015:10). Aerial robotics have served a number of roles in warfare such carrying weapons and participating in actual combat. According to Sapaty (ibid), the Northrop Grumman X-47B is an example of a UCAV designed for carrier-based operations. It has also been reported that 'it can fly as fast and has the ability to gather intelligence, conduct surveillance and reconnaissance, and launch combat strikes at an unprecedented speed' (ibid:11).

Land-based robots

Land-based robots have been applied to military warfare. They have been weaponised and used in various incidents of warfare in remote-controlled, semi-autonomous and full-automatic mode. The widely known, ground-based robotic weapons that are in use modern-day warfare are 'automatic weapons defence systems' (Melzer 2013:7). It has been held that these robotics are made to 'detect and intercept incoming missiles, artillery shells or mortar grenades, these systems must complete their detection, evaluation and response process within a matter of seconds, thus rendering any meaningful supervision by human operators impossible' (ibid). They have been used in the US and the Germany armed with machine guns, and the Israeli Iron Dome armed with interceptor missiles' (Human Rights Watch 2012:10-11).

The land-based robotic weapons used in warfare are called 'sentry robots'. Sentry robots have previously been used by South Korea along the demilitarised zone in 2010 (Weinberger 2012:13-15). Melzer states that those sentry robots came equipped with 'daylight and infrared cameras, heat and motion sensors, and pattern recognition software to spot humans up to a distance of 3 kilometres during the day and 1.5 kilometres during the night' (2013:8). For example, the SGR-1 associated with sentry robots is built with a microphone and speakers, 'so that it can ask and verify passwords from detected humans and, if necessary, sound an alarm' (Weinberger 2012:13-15). During combat, the SGR-1 sentry robot can fire rubber bullets or a 5.56 mm machine gun, and can be used in places with limited surveillance because it is 'equipped with an automatic mode that decides to fire its weapons against detected persons' (ibid).

Sentry robots can be used in border control to protect the state from any external threats that enter through its borders. For example, in guarding its borders along the Gaza Strip, 'Israel uses not only stationary sentry robots similar to the SGR-1, but also the Guardium' (Human Rights Watch 2012:15-16). The 'Guardium' is a remotely operated robotic vehicle which can be armed with lethal and non-lethal weapon systems (ibid). This robotic vehicle is designed to perform routine missions such as programmed patrols along border routes (ibid). However, it can also autonomously react to unscheduled events 'in line with a set of guidelines specifically programmed for the site characteristics and security doctrine' (ibid).

Maritime robots

Sea-based robots are generally known as Unmanned Maritime Systems (UMS). These can be either free-swimming or tethered to a surface vessel, submarine, or a larger robot (Berkowitz 2015). The US Department of Defense (2011:24-26) categorises them either as Unmanned Surface Vehicles (USVs) and/or Unmanned Underwater Vehicles (UUVs), and they are mainly used for mine detection and neutralisation. They are also used in submarine warfare (US Department of Defense 2011:24-26). The most widely used maritime weaponised robot is the Phalanx – an automatic weapons defence system. According to the US Department of Defense (2011:24-27), the Phalanx is designed to 'detect and neutralise hostile anti-ship missiles and fixed-wing aircraft through machine gun fire before they reach the defended ship … and is the only deployed, close-in weapons system capable of autonomously performing its own search, detect, evaluation, track, engage and kill assessment functions' It has the ability to counter 'asymmetric threats' such as speed boats, helicopters, and drones.

9 The Effects of Armed Drones on IHL

The operators of armed drones are far removed from terrains of warfare, and drones, which do not have any semblance of humanity, are unleashed into these terrains. These drones do not entertain the fear of getting injured or killed, nor do they have any understanding of the humanitarian laws and the principles that govern armed conflicts. As a result, inflicting harm to civilians and causing unnecessary suffering may be 'easy for them' (Caymaz and Demir 2017). Humanitarian laws 'limit the use of violence in armed conflicts to spare those who do not or who no longer directly participate in hostilities', while at the same time limit violence to the extent necessary to weaken the military potential of the enemy (UN 2011:14-15). These laws also limit violence and specify conditions that regulate the treatments of persons affected by armed conflicts, and attempt to strike a balance between humanity and military necessity (ibid:15). Quintana (2008) claims that the use of armed drones has resulted in an increase in ethical violations and causes grave human suffering. Finn and Wright (2012) also report that military drone strikes have resulted in an increase in loss of human lives and are unpopular with the public.

Scholars have argued that the use of armed drones in warfare has created numerous ethical challenges (Karppi, Böhlen & Granata 2016; Demir, Cicibas & Arica 2015). Moreover, as noted by the UN Special Rapporteur on extrajudicial, summary or arbitrary executions, the use of drones for intelligence, surveillance and reconnaissance, as well as for military strikes, has created tremendous legal and political challenges (UNHRC 2014). Pejic (2015) states that their use in military warfare conflicts with IHL, human rights law, and even the laws about state neutrality in war. Thus, these military drones pose real threats to the vitality of the

international legal framework. The use of AI technologies in military warfare has increased the manufacture of heavy and sophisticated weapons that are responsible for brazenly violating rules and principles of distinction between combatants and non-combatants. Although these weapons are vital in defending the state from external threats, they have not led to democratic governance to date. Despite this, it has been argued that the use of armed drones has the benefit of enabling military commanders to take more precise decisions (Meltzer 2013).

9.1 Armed drones and the prohibition of the use of force

The prohibition of the use of force is one of the rules of IHL and regulations for armed conflicts. Armed drones are being used in armed conflicts and in the war against terror. They have been used to carry out a range of warfare missions that have included targeted killings. Quintana (2008) posits that their use, particularly for targeted killings outside areas of combat, terrains or battlefields, have conflicted with the IHL rules and the international human rights standards. This means that the use of armed drones violate the IHL rules and other international human rights principles that are established to enable peace processes and ensure global peace and security. The UN Charter prohibits the 'threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations' (UN Charter 1945). The main aim of this prohibition is to protect state sovereignty (General Assembly resolution 3314, 194: XXIX), and to preserve and maintain the 'right not to be subject to coercion by any other sovereign state' (Corten 2010:169).

This prohibition is globally accepted as a norm of customary international law. Moreover, the concept of force in this study means armed force, and does not include political or economic coercion. Ruys (2014:167) notes that 'armed force may take various forms including incursions of military forces into another state's territory, or even cross-border shooting into foreign territory, regardless of whether armed confrontation results, and even if troops withdraw immediately' (ibid). General Assembly resolution 2625 (1970: XXV) and the ICJ Report (1986: para.228) add that:

> … the prohibition of use of force includes indirect force which is typically manifested by a State's participation in organised armed groups' or allied States' use of force on another State's territory, such as arming and training armed groups that actually use or threaten force against that State.

Furthermore, in the event that a state permits another state to use its territory to host armed drones, in order to commit acts of force against another state and control that state's infrastructure, this amounts to an indirect use of force (Schmitt and Wall 2014). Similarly, the use of force lowers the threshold for waging conflict and the use of armed UAVs provides incentives for other types of attacks, 'with negative effects both for civilian protection and for constraining the extent of a conflict' (UN 2015:43). The application of AI diplomacy to military fields has ignited the development of heavy weapons that has brought about strong incentives for armed forces to apply force beyond what is required by the IHL regulations.

The operators of armed drones have sought the legal reinterpretation of previous legal understandings to justify attacks under broader circumstances (UN 2015:44). Attacks by armed drones raise various issues, including discrimination and proportionality during warfare. Many armed drone attacks have reportedly been carried out with the permission of the state on whose territory the attack occurs. Such states, however, were barred from waiving

the targeted person's right to life (ibid:45). This was true in Somalia, Libya, and Pakistan. As a result, these armed drones operate without the full permission of states, constituting a violation of IHL and international human rights standards.

9.2 Armed drones and the distinction between civilians and combatants

The principle of distinction between civilians and combatants is the backbone and cardinal rule of the IHL (Corn 2012:437). This principle is highlighted in Article 51(2) of the First Additional Protocol (API), which provides that 'the civilian population as such, as well as individual civilians, shall not be the object of attack'. According to Henckaerts and Doswald-Beck (2009), this rule must be applied in all types of armed conflicts and warfare. Attacks by armed drones in Pakistan, Yemen, and Somalia are examples of 'wars on terror', a major issue that has emerged in the context of non-international armed conflict. The challenge now is to recognise and identify who is considered a legal target for lethal strikes. It is also difficult to determine which person is a member of an organised armed group located on the territory of a non-belligerent state in cases of non-international armed conflicts. It is also difficult to determine who moves into such territory after taking direct part in an ongoing conflict. The International Committee of the Red Cross (ICRC:2014) postulates that in the above situations, a person should not be considered a lawful target.

The IHL rules state that 'the Parties to the conflict shall at all times distinguish between the civilian population and combatants, and between civilian objects and military objectives' during armed conflicts or hostilities (Articles 48 and 51(2) of Protocol I; ICRC, *Customary Humanitarian Law*, Rule 1). The parties must also limit their military operations to 'military objectives' only, and the civilian population as a whole, as well as individual civilians, should not be targets of attack' (Articles 48 and 51(2) of Protocol I; ICRC, *Customary Humanitarian Law*, Rule 1).

This implies that the use of armed drones in warfare must be capable of distinguishing between innocent civilians who are not participating in the warfare and members of armed forces or/organised armed groups who are participating in the warfare. According to the Protocol, civilians may lose their legitimate protection only if they are involved in warfare. However, in cases of asymmetric confrontations with organised armed groups that shield themselves from civilians in the community, this is difficult to know and determine. This has been the case in Somalia where armed groups, responsible for terror attacks, take refuge among civilians. The use of armed drones, however, makes no distinction between who is a civilian and who is not, demonstrating a complete lack of consideration for this distinction in IHL (Melzer 2013).

This has also been the case with the US policy of 'signature strikes,' namely drone attacks against unidentified individuals suspected of being 'terrorists,' 'militants,' or 'jihadists' based on their personal behaviour, contacts, or other characteristics – legally undefined notions that are strictly irrelevant for lawful targeting (Heller 2013). According to Melzer (2013), this policy undermines the principle of distinction between innocent civilians and combatants enshrined in IHL rules, and fails to adhere to the precautions and presumptions that must be used in doubtful situations. Even when used from afar, the ability of drones to distinguish between civilians and combatants cannot be adequately controlled or assessed (ibid:7).

It has also been argued that armed robots, for example, do not need to protect themselves when the target is unclear or indistinguishable from innocent civilians (Konerta and Tomasz 2021). Armed robots, as autonomous weapon systems, are free of human emotions that drive

them to commit war crimes (ibid). It is also argued that autonomous weapons systems are incapable of distinguishing between combatants and non-combatants, whereas this is not difficult for humans to do (ibid:295), and thus violate the laws of armed conflicts. Similarly, Arkin (2020) argues that the use of digital technologies in warfare, such as autonomous UAVs, has made it difficult to distinguish between innocent civilians and combatants. Humans on the battlefield, on the other hand, can act within the ethical boundaries of war as defined by IHL (ibid). As a result, having fully autonomous weapon systems is risky, at least at the current level of AI technologies (Konerta and Tomasz 2021:296). Because of the current limitations of computer technology, the military would be foolhardy to implement fully autonomous weapon systems (ibid).

Iran has developed armed drones and supplies them to other states such as Hezbollah and Hamas, Sudan, and Syria (*The Guardian* 2013). For example, the Syrian regime has used armed drones to locate insurgents in densely populated areas and to monitor targets (CNN 2012). It is reported that the use of armed drones resulted in the deaths of many innocent civilians during these operations (ibid). Sudan has likely used the armed drones acquired from Iran to target innocent civilians in villages in Darfur and Kurdufan (Dorrie 2014). Furthermore, it is argued that 'the precision and discrimination narrative in the use of armed drones is largely a myth', and the diminishing distinction between civilians and combatants in 'current complex conflict situations actually increases the potential for civilian casualties' (Zwijnenburg and Van Hoorn 2015:16). Armed drones have repeatedly failed to distinguish between civilians and combatants, resulting in the deaths of several local people, tribesmen, and rescue workers, as well as injuries in follow-up strikes (Woods 2012).

9.3 Armed drones and the prohibition on inflicting unnecessary suffering

The use of armed drones in modern warfare causes unnecessary suffering to innocent civilians such as mental health, disorders, and anxiety, which is prohibited by IHL rules. The International Court of Justice (1996:238) defined unnecessary suffering as 'harm greater than that which is unavoidable in order to achieve legitimate military objectives'. Since 2014, the UN has been discussing a ban on armed drones and/or lethal autonomous weapons in warfare, with limited success (Sauer 2020). Armed drones have caused many deaths in Pakistan, and people continue to die helplessly because no one will come near them for fear of being victim to yet another air drone strike (Woods 2012a). It has been claimed that those who came to the aid of the injured and children were targeted by a second and subsequent drone strikes (ibid). According to a father of four children who lost one of his legs in a drone strike, many people are scared of drone attacks and refrain from offering assistance because they are afraid of being hit by another drone strike (Woods 2012b). As a result, they die painful deaths.

The suffering is exacerbated by the fact that there is a policy not to respond immediately to a reported drone strike due to follow-up strikes, and that six hours must pass before running to rescue the wounded or injured (Roggio 2009). It is also alleged that no medical personnel are permitted even after six hours have passed, and that only the locals, the poor, must pick up the bodies of loved ones (ibid). This means that even health professionals, including those from the Red Cross, fear for their lives and are not permitted to rush to the injured in order to provide first aid and possibly save lives. As a result, the effects of these drone attacks raise serious moral and legal concerns, constituting a violation of IHL. Armed drones then violate the law of armed conflict because they do not spare the lives of humanitarian personnel or the injured, let alone those of civilians (Henckaerts and Doswald-Beck 2006). Serle (2012)

contends that intentionally using armed drones in warfare violates IHL, and ultimately constitutes a war crime.

Armed drones that kill civilians inflict unnecessary suffering on survivors in times of need and saddle them with the responsibility to support incapacitated people who are no longer able to work to support their families. This is because armed drones generally deprive victims' families of key sources of income (Roggio 2009). Their families go through many struggles and sufferings to compensate for the lost income, often forcing children or other younger relatives to drop out of school in order to look for work at a young age (ibid). Living under drones has been likened to experiencing 'hell on Earth' and causes people to live in constant fear for their lives and safety (Rohde 2022). According to the International Human Rights and Conflict Resolution Clinic, or IHRCRC (2012:79), the constant presence of US drones overhead causes significant levels of fear and stress in civilian communities. Armed drones used in warfare have been described as a 'wave of terror' sweeping through the community. Children, adults, and women are terrified because no one knows when the next armed drone will strike. This situation causes anyone who lives in a state where armed drones are in use to live in constant terror (ibid: 81). The terror and fear drones instil in people will, for the most part, initiate trauma and mental health issues, posing threats to human security and well-being.

According to Minas (2014), mental health has remained a major public health issue, resulting in insecurity in many communities. Melzer (2013) captures this sentiment by arguing that people are scared because they do not know when the next strike will be, and when they hear it sounding in the sky, it is difficult to know where it ends, so they live in constant fear for their lives. It is also reported that armed drone victims suffer from mental disorders, anticipatory anxiety, and post-traumatic stress disorder as a result of their constant fear of drone strikes (IHRCRC 2012:82). This has resulted in emotional breakdowns, fleeing indoors, or hiding when drones appear above. Others report having experienced fainting, having nightmares and other intrusive thoughts, hypersensitive reactions to loud noises, outbursts of anger or irritability as a result of trauma caused by exposure to drone attacks (ibid).

10 Conclusion and Recommendations

The study has examined AI diplomacy and peace processes, focusing on the effects of armed drones on IHL. It has found that armed drones have far-reaching effects on the observance of IHL and pose threats to global peace, complicating global order in the post-Cold War era of international relations. The application of AI diplomacy to military warfare has caused significant pain to innocent civilians, and poses grave environmental threats. Armed drones fail to distinguish between innocent civilians and combatants, cause and trigger mental health and other disorders in people, and cause human insecurity. If traditional weaponry such as serrated-edge bayonets, bullets, poison and poisoned weapons such as projectiles smeared with substances that inflame wounds, biological and chemical weapons, and others used by humans on battlefields are taken to inflict unnecessary suffering on innocent civilians, the more so armed drones and militarised robots that are insensitive to the presence of humans on battlefields.

The 1949 Geneva Conventions, which established IHL rules to govern armed conflicts and were accepted by almost every UN member state, should be upheld and adhered to. The challenge is how to control armed drones or armed robots used in warfare while adhering to IHL principles. This study has found that armed drones and militarised robots inflict unnecessary pain and suffering on civilians, and that despite being used to combat terrorism,

they have not been very successful. Despite the use of armed drones and armed robots, terrorism and terror attacks remain a problem in the post-Cold War era. There is a need for an international call for AI governance, as well as an understanding of the effects and serious threats that armed drones pose to IHL and thus to peace processes in international relations and cooperation among world states.

States should evaluate new or modified weapons to ensure that they do not violate IHL, and should survey digital weapons early in the manufacturing process. Given how the digital revolution is reshaping the world, the application of AI diplomacy to military operations should be approached with greater caution in terms of its effects on IHL and the threats armed drones pose to international peace and security. This study points to the need for more engagement from scholars, policy-makers, human rights activists, and peace practitioners in the ongoing debates about AI diplomacy, aimed at developing effective rules and regulations. These rules should serve to mitigate the risks and threats associated with armed drones on IHL and international human rights standards, which are the foundations of the post-modern world.

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