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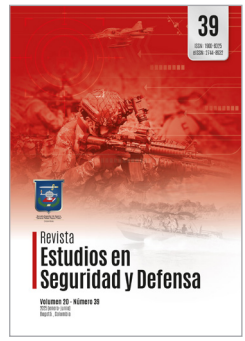

The Use of Drones in Security and Defense: Impacts and Challenges for Compliance with IHL and the Protection of Human Rights

El uso de drones en seguridad y defensa: impactos y retos para el cumplimiento del DIH y la protección de los derechos humanos

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Abstract

The article explores the impact and challenges of the use of drones in security and defense, focusing on compliance with International Humanitarian Law and the protection of Human Rights. It describes the technological advances of the 20th and 21st century, highlighting how connectivity and modern technology have transformed armed conflicts. Through the case studies of Syria and Ukraine, the operational advantages of drone use are examined. However, it also addresses critical challenges, including lack of accountability, dehumanization of targets, and potential normalization of IHL and HR violations. The article concludes with the need for improved transparency, accountability and ethical training of drone operators to ensure respect for international humanitarian norms.

Key words: Armed Conflicts; Disruptive Technologies; Drones; Global Security; Human Rights; International Humanitarian Law

Resumen

El artículo explora el impacto y los retos del uso de drones en seguridad y defensa, centrándose en el cumplimiento del derecho internacional humanitario y la protección de los derechos humanos. Describe los avances tecnológicos de los siglos XX y XXI, destacando cómo la conectividad y la tecnología moderna han transformado los conflictos armados. A través de los estudios de caso de Siria y Ucrania, se examinan las ventajas operativas del uso de drones. Sin embargo, también se abordan retos críticos, como la falta de rendición de cuentas, la deshumanización de los objetivos y la posible normalización de las violaciones del DIH y los DDHH. El artículo concluye con la necesidad de mejorar la transparencia, la rendición de cuentas y la formación ética de los operadores de drones para garantizar el respeto de las normas humanitarias internacionales.

Palabras Clave: conflictos armados; Derecho Internacional Humanitario; Derechos Humanos; drones; seguridad global; tecnologías disruptivas

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Introduction

The 20th century witnessed unprecedented technological advances that radically transformed the nature of warfare and conflict. Indeed, from World War I to the end of the Cold War, innovations in military technology not only changed combat tactics and strategies, but also had a profound impact on the scale and scope of armed conflicts around the world (Brown, 1999).

Within World War I, the beginning of modern warfare was established, where technology played a crucial role. Of the most substantial changes are the introduction of machine guns, long-range artillery, tanks and aircraft changed the dynamics of the battlefield (Hacker, 2005). Trenches and war of attrition were positioned as defining characteristics of the conflict, while new technologies significantly increased the lethality of battles. Chemical warfare also made its appearance, with the use of various gases causing indescribable suffering and new ethical considerations in warfare.

Later, during World War II, military technology advanced even more rapidly (Hartcup & Lovell, 2016). The development and use of radar improved air defense and detection capabilities, while submarines and aircraft carriers transformed naval warfare (Howse, 1993). One of the most significant advances was the creation and use of the atomic bomb by the United States at Hiroshima and Nagasaki. This new weapon not only ended the war in the Pacific, but also ushered in the nuclear age, posing new challenges to global security and military ethics. The mass destructive capability of nuclear weapons forever changed the way nations conceived of conflict and deterrence (Wyss, 2013).

With the transition to the Cold War, although characterized primarily by political and economic tension between the Western and Eastern blocs, it was also an era of technological innovations in the military realm. Advances in intercontinental ballistic missiles (ICBMs), satellite technology, and electronic espionage redefined and reconfigured defense and offense strategies (Yogev et al., 2022). In addition, the space race, in which the United States and the Soviet Union competed for dominance outside the Earth's atmosphere, also had profound military and strategic implications (Lai, 2021). In addition, the development of biological and chemical weapons continued, although their use was restricted due to international treaties (Spiers, 2010).

As the 20th century ended, computer technology and the digital revolution began to play an increasingly important role in armed conflicts (Hirblinger et al., 2024). The introduction of satellite navigation systems, such as GPS, significantly improved the accuracy of attacks and military logistics. While with respect to advances in communications allowed more effective coordination between dispersed units, and cyber warfare emerged as a new domain of conflict, where attacks on information networks and control systems can cause damage equivalent to or even greater than that of conventional weapons (Spanish Institute for Strategic Studies, 2010; Nestoras, 2018).

This is how the 20th century saw a radical transformation in the way wars were fought, driven by rapid technological advances (Kim et al., 2019). These innovations not only increased the destructive capacity of armies, but also introduced new ethical and legal considerations into the realm of armed conflict (Broussard et al., 2019). With the advent of the 21st century, these technologies have continued to evolve, leading to the development of new tools of warfare, such as drones, which pose both opportunities and challenges for security and defense, as well as for the protection of human rights (HR) and compliance with International Humanitarian Law (IHL) (Broussard et al., 2019; Hernández, 2021; Laurent, 2023; Vargas-Cano and Gil-Osorio,2023).

Connectivity and Technological Advancement: Additional Challenges for the Protection of IHL and Human Rights

Regarding the advancement of technology in the 21st century, it has brought with it an unprecedented level of connectivity that has transformed all aspects of society, including armed conflict (Qureshi, 2019). The integration of advanced technologies and global interconnectivity present significant additional challenges for the protection of IHL and HRDs. These advances have not only enhanced the operational capabilities of militaries but have also created new vulnerabilities and ethical dilemmas that must be responsibly addressed and considered (Broussard et al., 2019; Joachim & Schneiker, 2018).

For the same reason, it is necessary to mention the most influential technologies in this regard, which has been, within the digital revolution, the development of artificial intelligence (AI). The ability to process vast amounts of data in real time and the implementation of automated decision systems have changed the way military operations are planned and executed (Layton, 2020). However, the reliance on these systems also poses risks that must be considered. In this regard, the potential for errors in AI algorithms and the lack of transparency or meaningful vetting processes in automated decision making can lead to inadvertent violations of IHL and HR (Crosston, 2020; Rawat et al., 2021). In addition, cyber warfare also introduces attacks on critical infrastructure and information networks expanding the scope of conflict, which is not fully regulated by existing international laws, creating loopholes with respect to protection of fundamental rights (Cybersecurity and Infrastructure Security Agency (CISA), 2024; Warfield, 2012).

Admittedly, global connectivity has also facilitated the rapid spread of information, which can be both an advantage and a challenge for the protection of HRDs (Nikolic, 2018). On the one hand, social media and instant communication platforms enable rapid documentation and reporting of human rights violations, which can lead to greater accountability and justice (Gregory, 2019; Mehandru & Koenig, 2018). On the other hand, the spread of disinformation and propaganda can destabilize entire regions, exacerbate conflicts, and make it difficult to distinguish between combatants and non-combatants,

a cornerstone of IHL (Atkinson, 2018; Baines & Elliott, 2020). Manipulation of information can be used to justify violations of IHL and HR, further complicating the effective implementation of these regulations.

Another significant challenge is the proliferation of advanced surveillance technologies because while these tools can be crucial for national security and counterterrorism, they also raise serious concerns about privacy and abuse of power (Gil Osorio, et al., 2023; Banks, 2014; Guacaneme Medina, n.d.; Instituto Español de Estudios Estratégicos, 2010). Within these debates, the use of facial recognition and mass surveillance technologies can lead to systematic human rights violations, especially in authoritarian regimes where such technologies can be used to repress dissent and control the population (Hannas & Tatlow, 2020; Kaska et al., 2019). The lack of robust and binding legal frameworks to regulate the use of these technologies exacerbates the risk of abuse (Vargas Cano, et al., 2023).

In addition, interconnectivity has facilitated the development and proliferation of autonomous weapons, which operate with minimal human intervention (Gómez de Ágreda, 2020). These weapons pose serious ethical and legal challenges, as their ability to independently make lethal decisions may result in violation of IHL principles of distinction and proportionality. The lack of direct human oversight in the use of these technologies increases the risk of errors and abuses, complicating accountability for violations.

In this context, the international community faces the urgent task of updating and strengthening IHL and HR regulations to meet the challenges posed by connectivity and technological advancement (Broussard et al., 2019; Fischer, 2014). It is essential to develop legal and ethical frameworks to guide the use of these technologies, ensuring that they are used in a way that respects and protects fundamental rights.

In other words, while technology and connectivity have brought significant benefits in terms of operational capacity and efficiency, they have also introduced complex challenges for the protection of IHL and HR. The rapid evolution of these technologies requires an equally dynamic and adaptive response by the international community to ensure that laws and regulations keep pace with technological advances, thereby protecting the dignity and rights of all persons affected by armed conflict.

Challenges of Drone Use in Contemporary Conflicts and Warfare

Within the space of technological advances and global connectivity, drones have emerged as a milestone for modern military operations given their ability to perform reconnaissance, surveillance and precise strike missions without risking the lives of soldiers has revolutionized military strategy (Ayamga et al., 2021). However, the use of drones in current conflicts and wars poses complexities in terms of respect and protection of IHL and human rights HR (Gómez de Ágreda, 2020; Reyes Pulido, 2023).

Among the main challenges is the lack of accountability and transparency in drone operations as attacks carried out with this technology are often conducted in secret, making it difficult to monitor and independently assess compliance with IHL (Enemark, 2020; Saxon, 2016). Additionally, the emotional distance and dehumanization resulting from remote and distant control is brought to the table, which influences empathy and possible ethical considerations within decision making, increasing the risk of human rights violations.

In addition, the constant presence of drones in the areas of the country generates tense environments where fear and stress among civilians, negatively impacting their mental health and well-being. This underscores the need to develop effective legal frameworks that ensure that drone use respects existing bodies of law for human dignity (Hijazi et al., 2019).

Thus, as the impact of drones on security and defense is addressed, it is crucial to mention both the operational benefits and the emerging ethical and legal considerations for safeguarding IHL and HR in armed conflict. In this sense, the general objective of this article was defined as exploring the impact of the use of drones in the protection and enforcement of IHL and HR (Jiménez-Reina et al., 2023).

With the above in mind, and understanding that drones have revolutionized the field of security and defense, posing significant challenges that must be understood and addressed to ensure that humanitarian principles are respected and protected, and in line with the general objective, the following specific objectives of this research have been defined: (a) identify the operational advantages of drones for security and defense; (b) address the challenges presented by drones for IHL and HRD; (c) analyze case studies exemplifying the use of drones in recent conflicts in relation to IHL and HRD; and (d) assess the impact of drone use on IHL and HRD (Jiménez-Reina, et al., 2023).

Operational Advantages of Drone Use

It is undeniable that the use of drones in military operations has significantly transformed security and defense strategy and execution. These advanced technologies offer remarkable operational advantages that enhance the effectiveness and efficiency of armed forces in various conflict situations. Drones enable constant and detailed surveillance, collect real-time data, and execute precise strikes with unprecedented accuracy, which has revolutionized the way modern wars are fought (Ayamga et al., 2021).

One of the most prominent advantages of drones is their ability to reduce collateral damage through surgical and precise strikes (Kardasz & Doskocz, 2016). Equipped with advanced navigation systems and high-tech sensors, drones can identify and neutralize specific targets, minimizing the risk to civilians and keeping non-military infrastructure

out of hostilities. This precision not only improves the effectiveness of military operations, but, in theory, also complies with the principles of IHL, which requires the distinction between combatants and non-combatants (Bernal-Castro & Moya-Vargas, 2018; Sassòli, 2024).

Another crucial advantage is the reduction of risk for soldiers. By enabling reconnaissance, surveillance and strike missions from a safe distance, drones eliminate the need to deploy troops in dangerous situations. This not only protects the lives of soldiers, but also enables a faster and more flexible response to emerging threats (Mahadevan, 2010). The following discusses how drones improve accuracy and reduce collateral damage, as well as the advantages they offer in protecting soldiers' lives.

Accuracy and Collateral Damage Reduction

As mentioned, drones have revolutionized the field of security and defense, offering a precision in attacks that far exceeds the capabilities of traditional technologies, equipped with advanced navigation systems, high resolution sensors and artificial intelligence algorithms, drones can identify and attack specific targets with pinpoint accuracy (Mahadevan, 2010). This precision is critical to minimize collateral damage and protect civilians in conflict zones.

One of the primary ways in which drones improve strike accuracy is through their ability to conduct surveillance and detailed reconnaissance prior to an attack. Drones can fly at high altitudes and use high-definition cameras and thermal sensors to collect real-time information about terrain and enemy movements. This surveillance capability allows drone operators to carefully analyze the environment and plan attacks that minimize risk to civilians and non-military infrastructure (Ayamga et al., 2021).

In addition, drones are equipped with precision guidance systems, such as GPS and LIDAR, which allow attacks to be tailored with extreme accuracy. For example, laser-guided missiles can be targeted to specific points with minimal deviation, significantly reducing the likelihood of collateral damage (Warrior, 2015). This ability to conduct surgical strikes is particularly useful in densely populated urban areas, where the proximity of civilians and military targets increases the risk of unintended casualties.

A notable example of collateral damage reduction through drones is their use in counterterrorism operations. In conflicts such as Afghanistan, drones have been used to eliminate leaders of extremist groups without the need for massive bombing (Fernandez Pastor, 2017; Kreps & Zenko, 2014). In 2015, a drone strike in Somalia resulted in the elimination of a senior Al-Shabaab commander without causing civilian casualties ("Somali Al-Shabab Commanders 'Killed in Drone Strike'", 2015; Somalia: US drone strike killed top Al-Shabab figure | Al-Shabab News | Al Jazeera, n. d.). These types of operations

demonstrate how drones can be used to carry out precise strikes that minimize collateral damage and comply with IHL principles (Reyes Pulido, 2022).

Another example is the use of drones in Operation Inherent Resolve, the U.S.-led campaign against ISIS in Iraq and Syria (Who We Are, n. d.). Drones have played a crucial role in identifying and neutralizing strategic ISIS targets, such as weapons caches and command centers, with minimal collateral damage (Special Report, n. d.).

Risk Reduction for Soldiers

Now, it is necessary to emphasize that one of the most significant advantages of using drones in military operations is the protection they offer to the lives of soldiers (Mahadevan, 2010). By allowing reconnaissance, surveillance and attack missions to be carried out without the need to deploy troops on the ground, drones significantly reduce soldiers' exposure to dangerous situations. This capability not only preserves military lives, but also improves the morale and overall effectiveness of the military (Lee, 2020).

It is a significant advantage that drones can be used to carry out missions in extremely dangerous environments, where human presence would be unfeasible or excessively risky. For example, drones can operate in areas contaminated by chemical, biological or radiological agents, avoiding the need to send troops to places that could put their health and safety at risk. Additionally, drones can fly at high altitudes and perform surveillance missions in enemy-controlled areas, providing crucial information without endangering soldiers (NATO Review - Autonomous Military Drones, 2017).

Compared to conventional ground operations, the use of drones offers unprecedented operational flexibility considering that ground troops often face significant logistical and tactical challenges, such as the risk of ambushes, landmines and direct enemy attacks. While, on the other hand, drones can be rapidly deployed and repositioned in response to changes in the tactical situation, something that is much more difficult to achieve with ground troops. This mobility and adaptability make drones an invaluable tool in modern warfare, where the ability to respond quickly to emerging threats can make the difference between the success and failure of a mission (Anderson, 2013).

A concrete example of how drones have reduced the risk for soldiers is their use in demining operations. In places like Afghanistan and Syria, drones equipped with specialized sensors have been used to detect and deactivate landmines and improvised explosive devices (IEDs) without endangering the lives of soldiers (Fernández Pastor, 2017). This capability not only protects soldiers, but also speeds up the clearance process and reduces risk to civilians (Mahadevan, 2010).

Another example is the use of drones in rescue and evacuation missions. In situations where ground troops could become trapped or isolated in enemy territory, drones can provide essential supplies, medical support, and communication, facilitating rescue and evacuation without exposing more soldiers to danger (Bevacqua et al., 2015).

Additionally, drones can also act as close air support platforms, providing cover and fire support to troops on the ground without exposing human pilots to risk. This capability has been especially useful in urban operations and in difficult terrain, where the proximity of the enemy and the complexity of the environment increase the risk for soldiers (Ayamga et al., 2021).

Compared to conventional ground operations, where soldiers directly face the dangers of the battlefield, the use of drones allows for safer and more effective execution of missions. The ability of drones to operate in dangerous environments, provide air support, and conduct reconnaissance and attack missions without putting human life at risk represents a significant advance in modern military strategy (Rossiter, 2023). As drone technology continues to improve, its role in reducing risk to soldiers will continue to be a crucial aspect of its use in military operations.

Challenges for IHL and Human Rights

The use of drones in military operations, despite their numerous operational advantages, presents important challenges for IHL and Human Rights that cannot be ignored. These challenges arise mainly due to the remote and technological nature of drones, which introduces new dynamics and complications in the field of armed conflicts (Bermejo Garcia & Cocchini, 2020; Niyitunga, 2023). Among the main problems are the lack of accountability and transparency in drone operations, as well as the emotional distance and dehumanization that can affect the decision-making of operators (Warrior, 2015; Jiménez-Reina, et al., 2023).

The lack of accountability and transparency in the use of drones is a recurring concern that must be addressed. Drone operations are often carried out in secret, making independent monitoring and assessment of IHL compliance difficult. Without clear accountability, it is difficult to ensure that humanitarian standards are adequately respected, which can lead to violations of human rights and IHL (Enemark, 2013; Warrior, 2015).

Additionally, the emotional distance and dehumanization resulting from remote drone control can significantly affect military decisions. Drone operators, who are far from the battlefield, have come to experience emotional disconnection from the consequences of their actions, which influences empathy and increasing the risk of hasty and ethically questionable decisions (Joerden, 2018).

Challenges Regarding Accountability

The use of drones in military operations raises serious problems of accountability and transparency. As we saw, their remote nature, together with the fact that they are often carried out in secret, makes real monitoring and evaluation that is consistent with IHL and HR frameworks difficult (Buchanan & Keohane, 2015). These shortcomings undermine public trust in certain operations (Konert & Balcerzak, 2021).

One of the main problems related to the lack of transparency is that drone attacks are often unreported or under-reported. Governments and armed forces can classify information about these operations, preventing human rights organizations and other independent entities from monitoring and evaluating their legality and ethics (Buchanan & Keohane, 2015; Konert & Balcerzak, 2021). This creates a significant barrier to accountability, since, without adequate information, it is difficult to investigate and hold accountable the actors involved for possible violations of IHL and human rights.

The lack of accountability is especially concerning in cases where drone strikes result in civilian casualties. A notable example is the use of drones by the United States in Pakistan, Yemen, and Somalia, where numerous incidents have been reported in which drone strikes have killed civilians (Lewis & Vavrichek, 2016). In many cases, these incidents are not fully investigated, and civilian victims do not receive justice or adequate compensation. The lack of accurate and transparent data on collateral damage and civilian casualties complicates the task of assessing whether attacks comply with IHL principles of distinction and proportionality (Buchanan & Keohane, 2015; Warrior, 2015).

Furthermore, opacity in drone operations allows practices to be perpetuated that could be illegal under IHL (Konert & Balcerzak, 2021). For example, so-called signature strikes, where individuals are targeted based on suspicious patterns of behavior rather than concrete intelligence about their identity, have been criticized for violating IHL's principle of distinction (Heller, 2013; Ndi, 2015). Without a transparent mechanism to review and evaluate these attacks, it is difficult to ensure compliance with international regulations.

The lack of accountability also affects drone operators. The physical and emotional distance from the battlefield can lead to a disconnection from the real consequences of their actions (Joerden, 2018). Without an effective oversight and accountability system, operators may not be fully aware of the implications of their decisions, which could increase the risk of violations of IHL and human rights (Enemark, 2013).

To address these issues, it is essential that more transparent and robust oversight and accountability mechanisms be implemented. Governments and militaries must be more transparent in their drone operations, providing detailed and accessible data on attacks, casualties, and review procedures (Buchanan & Keohane, 2015). Furthermore,

independent commissions should be established to investigate incidents of civilian casualties and other possible violations of IHL and human rights, ensuring that justice is done, and adequate compensation is provided to victims.

In this sense, the lack of accountability and transparency in the use of drones poses serious challenges for the protection of IHL and human rights. It is essential that measures be taken to improve oversight and ensure that drone operations are carried out in a transparent and accountable manner, respecting international regulations and protecting the fundamental rights of all people affected by armed conflict (Buchanan & Keohane, 2015; Ndi, 2015; Warrior, 2015).

Emotional Distance and Dehumanization

The use of drones in military operations introduces significant physical and emotional distance between operators and the battlefield, which can have a profound impact on the psychology of operators and the quality of their decisions. This distance can lead to the dehumanization of the objectives and negatively affect adherence to the principles of IHL and Human Rights (Kasachkoff & Kleinig, 2018; Jiménez-Reina, et al., 2023).

The psychological impact on drone operators is an area of growing concern as, while they are not physically in danger, they experience a unique form of stress as they are often located thousands of kilometers from the conflict site and exposed to real-time images. of the attacks and their consequences (Johnston Huntington & Eckert, 2022). This type of remote stress can be intense and long-lasting. Studies have shown that drone operators can suffer from post-traumatic stress disorder (PTSD), anxiety and depression, like the symptoms experienced by soldiers on the battlefield (Phelps, 2021). However, these problems are often compounded by a lack of recognition and support, as drone operators are not seen as traditional combatants.

In addition to the psychological impact, the emotional distance involved in operating drones can lead to the dehumanization of targets (Joerden, 2018). By interacting with their targets through screens and sensors, operators can come to see them as mere dots on a monitor rather than human beings. This dehumanization can decrease empathy and ethical consideration in decision making. Drone operators may be more likely to authorize attacks without a full assessment of the potential humanitarian consequences, increasing the risk of violations of IHL and human rights (Coeckelbergh, 2013).

Dehumanization also affects military decision-making by reducing the perception of the consequences of attacks. The absence of direct contact with the battlefield can leave operators feeling disconnected from the realities of the conflict, which can lead to a greater willingness to accept collateral damage (Voice, 2022). This disconnect can result in a less rigorous application of the IHL principles of distinction and proportionality, which

are essential to protect civilians and limit harm during military operations (Jiménez-Reina, et al., 2023).

A concrete example of these effects can be seen in signature strikes, where attacks are carried out based on suspicious behavioral patterns detected by drones rather than concrete intelligence about the identity of the targets. These attacks, which often result in civilian casualties, illustrate how dehumanization and emotional distance can lead to decisions that do not comply with humanitarian norms (Enemark, 2013; Kasachkoff & Kleinig, 2018; Niyitunga, 2023). Without the immediate pressure of battlefield presence, operators may be less careful in verifying the identity of targets and assessing risk to noncombatants.

To mitigate these effects, it is crucial that drone operators receive adequate ethical and psychological training. They must be trained not only in technical skills, but also in the importance of IHL and Human Rights regulations (De Swarte et al., 2019; Kohn et al., 2024). In addition, it is necessary to provide them with continuous psychological support to help manage stress and avoid dehumanization (Armour & Ross, 2017; Saini et al., 2021). Implementing realistic simulations that include ethical and humanitarian scenarios can help you maintain emotional connection to the consequences of your actions.

As has been demonstrated, the emotional distance and dehumanization in the use of drones present serious challenges for the protection of IHL and human rights. Addressing these challenges requires a combination of appropriate training, psychological support and robust accountability mechanisms to ensure that drone operators make decisions that respect fundamental humanitarian principles.

Case Studies in Contemporary Conflicts

The use of drones in recent armed conflicts has provided numerous examples that illustrate both the advanced capabilities of these technologies and the ethical and legal challenges they pose (Enemark, 2013; Kohn et al., 2024; Niyitunga, 2023). Drones have been deployed by various actors in complex conflicts, such as those in Syria and Ukraine, where their impact on the ground has been significant. These case studies offer a detailed view of how drones are used in practice and allow compliance with IHL and Human Rights to be assessed in specific contexts (Montero Moncada, et al., 2023).

Within the Syrian conflict, for example, multiple actors, including governments and non-state armed groups, have employed drones for a variety of missions, from reconnaissance and surveillance to direct attacks (Antonova & Ezzor, n. d.). This diverse use has generated a complex panorama of adherence to and violations of IHL and Human Rights, highlighting both the operational advantages and risks associated with drones (Jiménez-Reina, et al., 2023).

On the other hand, Ukraine has also seen extensive use of drones, particularly in operations carried out by Ukrainian forces and separatist forces supported by Russia (Díaz Galán, 2022; Rondeaur, 2019; Sengupta, 2023; (Montero Moncada, et al., 2023). Drones have been used to identify enemy positions, direct artillery strikes, and monitor troop movements, which has significantly influenced conflict dynamics (NATO Review - Autonomous Military Drones, 2017; Lee, 2020). Analyzing these cases allows us to better understand the positive and negative impacts of drones on the protection of civilians and respect for humanitarian regulations.

Use of Drones in the Syrian Conflict

Regarding the Syrian conflict, which began in 2011, it has been one of the most complex and devastating scenarios of the last decade. Drones have been used by various actors in this conflict, including the Syrian government, opposition forces, the United States, Russia, and other non-state armed groups. The use of drones has transformed the way battles are fought, providing advanced surveillance, reconnaissance and precise strike capabilities. However, it has also raised serious concerns regarding compliance with IHL and human rights (Sims, 2018).

Thus, the Syrian government has used drones mainly for surveillance and reconnaissance, allowing constant monitoring of enemy positions (Lasconjarias & Maged, 2019). These drones, supplied primarily by Iran and Russia, have been crucial to the government's military operations, providing real-time intelligence and enhancing rapid response capabilities. On the other hand, opposition forces have also used drones, although with more limited capabilities, to carry out reconnaissance missions and, in some cases, improvised attacks using commercial drones equipped with explosives.

Regarding the above, the United States has deployed armed drones in Syria as part of its campaign against ISIS, carrying out precise attacks against leaders and strategic positions of the extremist group (Sims, 2018). These drones have played a crucial role in dismantling ISIS's command structure and reducing its operational capacity. However, these attacks have also come under criticism due to reports of civilian casualties and a lack of transparency in operations.

Regarding the same, Russia, another major player in the Syrian conflict, has used drones for both reconnaissance and airstrikes. Russian drones have provided vital intelligence to coordinate airstrikes and ground operations, supporting the Syrian government in its fight against opposition forces and terrorist groups (Thomas, 2020). Like the United States, Russia has faced criticism over a lack of transparency and reports of collateral damage caused by its drone operations.

In this context, numerous challenges have been raised for compliance with IHL and the protection of human rights. Drone attacks, especially those carried out by external

actors such as the United States and Russia, have been criticized for their lack of transparency and the difficulty of verifying the legality of the attacks (Lasconjarias & Maged, 2019; Sotoudehfar & Sarkin, 2023). The lack of accurate data on civilian casualties and the destruction of civilian infrastructure complicates the assessment of proportionality and distinction, fundamental principles of IHL.

Regarding this problem, drone attacks that result in civilian casualties and collateral damage generate an environment of fear and mistrust among the civilian population (Enemark, 2013; Kasachkoff & Kleinig, 2018). Additionally, signature strikes, where attacks are based on behavioral patterns rather than specific intelligence about the identity of targets, raise serious ethical and legal concerns. These attacks, which have been used by both the United States and other actors, often result in the deaths of civilians, which constitutes a violation of IHL's principle of distinction.

In this sense, the lack of accountability and opacity in drone operations exacerbate these problems. Without robust mechanisms to investigate and hold accountable perpetrators of IHL and human rights violations, civilian victims are often left without justice or compensation (Warrior, 2015). Human rights organizations have repeatedly called for greater transparency and oversight in drone operations to ensure that international regulations are met, and fundamental rights are protected (Buchanan & Keohane, 2015; Larkin, 2016).

Thus, the use of drones in the Syrian conflict has demonstrated both their advanced capabilities and their significant risks for compliance with IHL and the protection of human rights. It is crucial that the international community and actors involved in the conflict take measures to improve transparency, accountability and respect for humanitarian regulations in the use of drones, to mitigate collateral damage and protect civilians.

Drones in the Ukrainian Conflict

Now, regarding the Ukrainian conflict, which began in 2014 with the annexation of Crimea by Russia and continued with the war in the Donbas region, it has been a scenario in which drones have played a crucial role in military operations. (Sotoudehfar & Sarkin, 2023). Both Ukrainian forces and Russian-backed separatist forces have used drones for a variety of missions, from reconnaissance and surveillance to directing artillery strikes and conducting direct attacks (Montero Moncada, et al., 2023).

Since the beginning of the conflict, Ukrainian forces have used drones to improve their surveillance and reconnaissance capabilities. Modified commercial drones and military drones have been used to monitor the movements of separatist forces, identify enemy positions, and direct artillery strikes with greater precision (Chávez & Swed, 2023). For example, the use of drones by the Ukrainian military has made it possible to detect and

destroy enemy artillery positions, preventing attacks that could have caused significant casualties among troops and civilians.

In this case, separatist forces have also used drones, in many cases supplied or technically supported by Russia (Chávez, n. d.). These drones have been used for reconnaissance missions and to coordinate artillery attacks against Ukrainian forces. A notable example is the use of drones by separatist forces to direct attacks against Ukrainian positions at the Donetsk airport, which resulted in intense fighting and significant damage to infrastructure (Zinets, 2014).

Thus, Russia has used advanced drones to provide intelligence and direct support to separatist forces. Russian drones have performed in-depth reconnaissance missions, providing critical data on the positions and movements of Ukrainian forces (Sotoudehfar & Sarkin, 2023). Additionally, there have been reports of direct attacks by Russian drones against Ukrainian positions, although these incidents are more difficult to verify due to a lack of transparency (Montero Moncada et al., 2023).

Considering the above, it should be mentioned that the use of drones in the Ukrainian conflict has had a mixed impact on the protection of civilians and respect for IHL and human rights. On the one hand, drones' ability to conduct detailed surveillance and reconnaissance has allowed Ukrainian and separatist forces to direct their attacks with greater precision, potentially reducing collateral damage and civilian casualties (Kunertova, 2023). The precise identification of military objectives allows the impacts on surrounding civilian areas to be minimized, complying with the IHL principle of distinction.

However, there have also been numerous reports of drone strikes resulting in civilian casualties and destruction of civilian infrastructure. The lack of transparency and accountability in these attacks complicates the assessment of their compliance with IHL. Indiscriminate or disproportionate attacks, which do not adequately distinguish between military and civilian targets, constitute serious violations of IHL. In several incidents, drone attacks have caused the deaths of civilians, generating additional fears and tensions among the affected population (Chávez & Swed, 2023).

Now, we must remember that the constant presence of drones in conflict zones contributes to a climate of fear and additional stress among civilians, since the possibility of being watched or attacked by drones at any time significantly affects mental health and the general well-being of the civilian population (Lasconjarias & Maged, 2019). Furthermore, the use of drones for information and propaganda warfare has exacerbated tensions and made it difficult to distinguish between truth and disinformation, further complicating the humanitarian situation in the region (Montero Moncada et al., 2023).

While drones have provided significant operational advantages in the Ukrainian conflict, their use has also posed serious challenges for the protection of civilians and

compliance with IHL and human rights. It is essential that all parties to the conflict take measures to ensure transparency and accountability in the use of drones, and strictly adhere to international humanitarian regulations to minimize the impact on civilians and protect human rights.

Impact of the Use of Drones in Armed Conflicts on IHL and Human Rights

It is imperative to understand that the use of drones in modern conflicts has raised serious concerns about the possible normalization of violations of IHL and human rights. As drones become a common tool in military operations, there is a risk that humanitarian regulations and principles will be compromised due to the remote and often clandestine nature of these operations (Rothe & Collins, 2014).

One of the main problems, already mentioned above, is the known lack of transparency and accountability in the use of drones. As discussed, drone attacks are often carried out without adequate oversight, and information about them is often kept secret (Warrior, 2015). This characteristic and normalized opacity makes it difficult to independently evaluate compliance with IHL and Human Rights, which can lead to the normalization of practices that violate these regulations. The lack of accurate data on civilian casualties and collateral damage in official reports allows perpetrators of violations to avoid accountability, fostering an environment where violations can become routine.

Furthermore, the physical and emotional distance between drone operators and their targets can reduce empathy and ethical consideration in decision making (Armour & Ross, 2017; Johnston Huntington & Eckert, 2022; Saini et al., 2021). Operators, who control drones from remote locations, can dehumanize individuals on the ground, seeing them as mere dots on a screen rather than human beings. This dehumanization can lead to a greater willingness to accept collateral damage and make decisions that do not comply with the principles of distinction and proportionality of IHL (Joerden, 2018; Joinet, 1997). As these practices become more common, there is a risk that an operational culture will be established where violations of IHL and human rights are seen as acceptable or inevitable.

In addition to the above, the use of drones has also led to the adoption of tactics such as signature strikes, where attacks are based on suspicious patterns of behavior rather than concrete intelligence about the identity of the targets (Heller, 2013; Ndi, 2015). These attacks, which often result in the death of civilians, represent a serious violation of IHL's principle of distinction. The growing acceptance of these tactics may normalize the violation of this fundamental principle, undermining the protection of civilians in armed conflict.

The constant presence of drones in conflict zones can also have a significant psychological impact on affected communities (Hijazi et al., 2019). The perception of constant surveillance and the possibility of sudden attacks generate a climate of fear and continuous stress. This situation can lead to the normalization of suffering and human rights violations, where affected communities become accustomed to living under constant threat, which desensitizes both perpetrators and victims to human rights violations (Rothe & Collins, 2014).

To counter the normalization of violations of IHL and Human Rights, it is essential that the international community adopt robust measures to improve transparency and accountability in the use of drones (Buchanan & Keohane, 2015). This includes the implementation of independent oversight mechanisms and the obligation of States to accurately and comprehensively report on drone operations, including collateral damage and civilian casualties. In addition, ethical training programs must be established for drone operators, ensuring that they understand and respect the principles of IHL and Human Rights.

Conclusions

Throughout this article, the impact of the use of drones in armed conflicts and its relationship with IHL and Human Rights has been explored. Drones have proven to be powerful tools in the military, offering significant operational advantages, such as precision in attacks and reduction of risk to soldiers. However, they also pose critical challenges that must be addressed to ensure respect for and protection of humanitarian regulations.

Several operational advantages of drones were identified, including their ability to conduct precise strikes that minimize collateral damage and their ability to protect soldier lives by eliminating the need to deploy troops in dangerous situations. However, these operational benefits are offset by serious challenges related to the lack of accountability and transparency in drone operations, as well as emotional distance and dehumanization that can negatively impact military decision-making.

The case studies in Syria and Ukraine illustrate how drones have been used by different actors in armed conflicts, highlighting both their advanced capabilities and their significant risks for compliance with IHL and the protection of human rights. In both conflicts, a lack of transparency and accountability has complicated the assessment of the legality and ethics of drone operations, while the constant presence of drones has generated a climate of fear and stress among civilians.

The article also discussed how the use of drones can lead to the normalization of IHL and human rights violations. Opacity in operations, dehumanization of targets, and the adoption of questionable tactics such as signature strikes contribute to an environment where violations can become routine and acceptable.

The findings of this article are crucial to understanding the challenges posed using drones in armed conflict. It is essential that the international community recognizes these challenges and takes proactive measures to improve transparency, accountability and ethical training for drone operators. Only through a concerted effort to adequately regulate and monitor the use of drones can we ensure that these technologies are used in ways that respect and protect international humanitarian regulations.

In summary, while drones offer significant operational benefits, their use poses serious risks to IHL and human rights. It is crucial that robust measures are put in place to ensure that drones are used responsibly and in accordance with humanitarian regulations, thereby protecting the rights and dignity of all people affected by armed conflict.

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