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International responsibility for the use of military drones : between the Legal vacuum and the inevitability of a transitional phase in the development of international law

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Abstract:
This study addresses the issue of international responsibility for the use of military drones in light of the rapid technological transformation occurring in the field of armed conflicts, where these devices have evolved from mere reconnaissance tools to advanced combat systems relying on artificial intelligence. The study highlights the absence of a specific international legal framework regulating their use, despite their subjection, in principle, to the rules of international humanitarian law, particularly the principles of distinction, proportionality, and military and humanitarian necessity. It also discusses the jurisprudential divide between a school of thought advocating for a preemptive ban due to the risks of technological autonomy, and another supporting controlled use within the framework of existing rules. The study sheds light on the problem of the responsibility gap resulting from the difficulty of attributing actions to a specific actor under autonomous systems, and concludes that the current rules, despite their existence, face significant challenges in implementation.
Keywords: International responsibility, military drones, artificial intelligence, international law, autonomous operation.

Introduction

There is no doubt that we are in an era in which media, communication and digitization have become the focus of great attention by various countries of the world, due to the radical transformations they have brought about that are no longer limited to improving daily life only, but rather their effects have extended to reshaping the standards of power and influence, both internally and internationally, an era in which the dynamism of change has become the established rule, and continuous modernization is a necessity, not an option.

At the heart of this transformation, in recent decades, the world has witnessed a qualitative leap in military technology, exceeding the limits of the traditional perception of armed conflict. Combat robots and autonomous artificial intelligence systems, such as drones, have come to occupy a central position in modern conflicts. The war between the Israeli entity and Iran, the United Nations, Palestine, and the Russian-Ukrainian war in these recent days is for the better.

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There is no doubt that the latter will constitute a practical reference for many countries of the world, prompting them to reconsider Classic war concepts, and reformulating their defensive and offensive strategies according to the requirements of conflict supported by advanced technology.

This study highlights the urgent need to reconsider the rules of international law and adapt them in line with technological development, especially in the military field, and rebuild them in a way that is compatible with this profound technical transformation. The future does not wait, and the law's slowness in keeping pace with it may threaten not only international justice, but also the moral and humanitarian balance in the management of wars, and perhaps a dangerous slide that threatens nature as a whole.

In light of the specificity of these war robots that operate in combat environments based on artificial intelligence algorithms, they are capable of making decisions that may cause serious human and material losses, without even direct human intervention. This calls us to question the extent to which smart military drones are subject to the rules of international humanitarian law in the absence of rules regulating their use. Thus, a legal and ethical problem arises, represented by who asks internationally about the actions of these military robots? Owning state? Manufacturing country? Did the military commander order his release? Or is responsibility lost in a legal vacuum that did not anticipate such a development?

Accordingly, the general problem arises in this research paper: **Is it possible to determine international responsibility for the damage caused by military drones? Are the current rules in international law sufficient to hold accountable the parties responsible for their use?**

To answer this problem, the descriptive approach will be adopted to clarify the conceptual and legal framework related to the use of drones, the analytical approach to dismantle the relevant legal texts and evaluate their effectiveness, and the comparative approach to compare experiences and legal models in a number of countries and relevant international organizations, according to two main axes:

- **First axis:** The legal framework for military drones in armed conflicts
- **The second axis:** The limits of international accountability for crimes committed by military drones

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I. The legal framework for military drones in armed conflicts

Drones have witnessed a qualitative transformation in the structure of contemporary military operations, as they are no longer just a means of reconnaissance, but rather an effective combat tool capable of carrying out precise, cross-border strikes with the lowest direct human cost. Its role has clearly emerged in modern conflicts, especially in the war between Russia and Ukraine, Iran, the United States of America, and the Israeli entity, which revealed the transition of wars to a technological pattern based on unmanned systems. Although many countries have established regulatory frameworks for the civil and commercial use of drones, in terms of registration, licensing, and operating controls, the military field still lacks a special and integrated international regulation that defines the legal nature of the armed drone and controls

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the conditions for its use. Therefore, we must research the concept and nature of the military drone, highlight its characteristics, and then delve into the controls for its use in international law.

1) The nature and nature of military drones

Before delving into studying the characteristics of the military drone and the problems of legality and international responsibility resulting from its use, it becomes necessary to take stock of its definition and clarify its origins, because of this importance in understanding the nature of this modern means of combat. Explaining its historical origins and the evolution of its role from a mere reconnaissance means to an advanced offensive tool is an essential introduction to its legal adaptation and to determine the extent to which it is subject to the rules of international humanitarian law and the principles of distinction and proportionality. This preamble also helps in drawing up the legal framework that allows for assessing the responsibility of states and operators for potential damages, thus preparing the ground for an accurate analysis of the problems of the military use of drones in contemporary conflicts.

Definition of military drone (military drone)[1] : The military drone is one of the most prominent modern military technologies that have changed the methods of combat and surveillance in contemporary wars. **It is stated in the language**: "Airplane" is a word derived from "taar" and "tayr," and a bird is everything that flies in the air with its wings, and it is said that something flew, "tayr" and "tayr," meaning it rose in the air and moved from one place to another. The word bird is applied to every being or thing that moves in the air by flying, and accordingly, the plane in the linguistic sense is derived from the verb "taar," and it refers to everything that flies or soars in the air[2].

It can be clean - unmanned - that is, without a pilot inside it and controlled from outside remotely, or it can fly using an electronic or computer program and be used in transportation and war. According to what was also stated in the Cambridge Dictionary definition[3].

As for the terminology: many definitions have been presented for military drones, where some defined it as "an aircraft that can fly without a pilot on board and can carry lethal weapons - ballistic or semi-ballistic missiles, torpedo projectiles, mines" (it can be without weapons or sensors), as others defined it as "it is an aerial vehicle characterized by the absence of a human element on board, but this does not mean that it is an aerial vehicle completely independent of humans, but rather that it is programmed." Advance to fly into the air and carry out its missions[4].'

As defined by the US Department of Defense, it is an air vehicle that uses air force to lift the vehicle. It can fly independently or can be flown remotely. It can carry a lethal or non-lethal load and can be recovered at the end of the mission. The lack of a crew allows it to carry out flights for a longer period and may be exposed to great risks. One of the advantages is that it allows for cost reductions compared to manned aircraft [5].

It was also defined that they are airborne systems that can be operated in conjunction with a ground control station in the direct line of sight area or beyond this area via satellite.

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It should be noted that the term drone has many names and uses depending on linguistic and technical contexts. There are those who call it drones in its common Arabic form, while the term "Drones" is used in English and French, and it originally refers to male bees, and this name was given due to the sound that these aircraft make during their flight, which resembles the buzzing of bees in the air. Several technical abbreviations have also appeared to denote this concept, the most prominent of which are: UAV (Unmanned Aerial Vehicle), and UAS (Unmanned Aircraft System). And RPA (Remotely Piloted Aircraft), RPAS (Remotely Piloted Aircraft System)...etc.

On the other hand, these aircraft are also known by alternative names such as: unmanned aerial vehicles, drones, and remotely piloted aircraft systems. In the military field, it is sometimes described in terms such as war robots or unmanned combat systems, due to its increasing role in modern military operations.

These aircraft have become one of the strategic tools adopted in contemporary wars, because of the ability they provide to carry out missions in remote or dangerous areas without exposing individuals to danger, as well as their contribution to reducing human losses and collateral damage compared to traditional wars. Its military uses include reconnaissance, surveillance, espionage, and monitoring missions, in addition to combat operations. It also features the ability to be recovered and reused multiple times, which gives it a clear advantage compared to guided missiles or autonomous systems that explode after carrying out their mission without the possibility of recovery.

Its upbringing:

The idea of the emergence of drones dates back to the middle of the nineteenth century, specifically to the year 1849, during the events of the Siege of Venice in 1849, when Austrian forces attacked the city of Venice using balloons loaded with explosives, powered by hot air or gases such as hydrogen, in an attempt to drop bombs remotely without exposing soldiers to danger. This attempt is considered one of the first primitive applications of the idea of an unmanned aerial attack, despite its lack of precision and control.

At the beginning of the twentieth century, this concept witnessed remarkable development during World War I, when the first attempts appeared to develop remotely controlled aircraft using radio signals. In 1918, the US Army developed an experimental model known as the Kettering Bug, a small plane loaded with explosives designed to function as a 'flying bomb'. Despite its historical importance, sources indicate that it was not actually used in combat operations.[6]

As for the first practical use that is closer to the modern concept of drones, it was achieved in 1935, when the British Royal Air Force re-equipped the De Havilland DH.82B Queen Bee biplane, providing it with a radio control system and servo devices, which allowed it to be piloted remotely without a pilot on board. Although it could be piloted manually from the front seat, it was often used as a training target aircraft, flying unmanned, which constituted a decisive step in the development of modern drone technologies [7].

Reconnaissance, surveillance, and espionage tasks constituted the actual beginnings of the emergence of drones, as the need for them emerged as a means of reducing human risks and

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providing accurate information from deep within enemy areas. This role was clearly embodied during the Vietnam War, where these aircraft were used to collect intelligence information and monitor military movements in complex combat environments.

As technology developed, the scope of its use expanded remarkably, especially by the United States, which relied on it in several contemporary conflicts, most notably the war in Afghanistan, operations in Pakistan, as well as during the 2003 invasion of Iraq, in addition to its use in Yemen and other regions. Perhaps the most recent is its war today with Iran, in its use of targeted killingve in For prominent figures, these aircraft have proven very effecti[8] carrying out precise strikes and reducing collateral losses compared to traditional means, which made them a pivotal tool in what is known as asymmetric warfare.

Over time, drones have transformed from being merely a means of reconnaissance into a multi-role weapon, capable of carrying out combat missions, continuous surveillance, electronic warfare, and even rescue operations and logistical support. This transformation has led to an intensification of international competition, as countries - and even some armed groups - race to possess and develop this technology, given the clear strategic superiority it provides.

Estimates indicate that global spending on these systems is likely to exceed $100 billion in the near future, with more than forty countries seeking to develop and manufacture advanced models of them. The United States and the Israeli entity are at the forefront of this field, which dominate a large portion of the global drone market, whether in terms of production, export, or technical development.

China has also emerged as a rising power in this field, as it has a diverse arsenal that includes more than 25 types, including advanced models such as the “Trodactyl” and “Sword Dragon,” capable of flying at high altitudes of up to about 13,000 meters, and at high speeds, with an effective ability to target land and sea targets using precision missiles.

On the other hand, Iran has achieved remarkable progress, especially in developing suicide drones (attack drones), such as the “Fitras” and “Shahed,” the use of which has emerged today in the American and Israeli war on Iran. Turkey is also one of the leading countries and a strong competitor in this sector, thanks to aircraft such as the “Aksungur” and “Bayrakdar,” which have proven their effectiveness on the battlefields and achieved a remarkable presence in the military export market.

At the Arab level, there are attempts to develop this technology, although they are still in varying stages compared to the leading countries. Among these experiments is the Algerian project for the “Amal 1-400” aircraft, which was announced in 2013, in addition to projects in Saudi Arabia such as “Luna” (as an advanced version of a German model), as well as in Egypt since 2016, in addition to other scattered efforts in some other countries[9].

Based on this rapid development, it is expected that drones will gradually replace a number of manned aircraft, whether in reconnaissance missions or even in combat operations, including some of the roles of fighters and bombers, which reflects a radical shift in the nature of modern wars and the balances of military power in the world.

Legal adaptation of drones: The legal adaptation of unmanned aircraft (drones) is one of the modern legal problems that has sparked a wide debate in international jurisprudence, due to

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the multiple areas of their use, whether in the civil, commercial, or agricultural field, all the way to the military field, which is considered the most sensitive. This overlap results in complex legal effects within the framework of public international law, and even within the scope of private international law in some applications of a cross-border nature.

Despite the absence of a unified and explicit international legal regulation governing drones in the military field, legal jurisprudence has settled on interpretive approaches that allow determining their legal adaptation according to the nature of their use, as follows:

- drone is a movable property that performs a specific function: Drones are legally adapted as movable property of an inanimate, material nature, which makes them suitable to be the subject of various legal transactions of a financial nature, such as sale, lease, and gift contracts, within the framework of the regulatory controls imposed by national legislation and international rules. However, this adaptation does not lead to considering them as an end in themselves. Rather, legal jurisprudence recognizes that they are merely a means and a technical tool used to carry out specific operations, which is what Its functional **character is linked to the purpose of its use**[10] ،Whether in the civil, commercial, or even military fields that are the subject of study Accordingly, drones are not given the status of weapons in themselves, but rather this description remains linked to the nature of the equipment and systems with which they are carried, such that they do not acquire a military character unless they are provided with combat means that make them a tool for military operations.
- Drones are a robotic weapon: There is another trend that sees drones as a weapon, since their first use was in the military field before it developed into other fields and was more flexible and modern, not to mention if it was equipped with advanced and self-operating weapon systems. They also see the necessity of subjecting it to the provisions of international humanitarian law, similar to traditional military aircraft; Therefore, its legitimacy is not measured by its existence alone, but also by how it is used and the extent of its compliance with international military principles and controls.

  It is also considered a robot, and we see that it is technically classified within the system of robots as programmable machines that perform multiple tasks based on the integration of artificial intelligence, computer science, and engineering. They may operate with varying degrees of independence, but this description does not change their legal status. Legally, these systems do not have any independent personality. Rather, they are considered a tool whose actions are attributed to the state or the individuals responsible for operating them, regardless of the degree of their automation. The jurisprudential debate about giving robots an “electronic personality” remains within the scope of a theoretical proposal today, without it being necessary.

  It should also be noted that when a high level of independence is reached in making decisions for these unmanned aircraft, they are included in what is known as autonomous weapons, a category whose international organization has not yet been decided, and these systems are classified according to contemporary trendsTo: fully - [11]. autonomous, or subject to human supervision capable of intervention, or semi-

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autonomous and pre-programmed, without this classification entailing its exemption from complete submission to the rules of international humanitarian law.

Therefore, we see that in conclusion, the legal regulation of military drones, regardless of their technical forms, remains legally traditional means of combat in terms of responsibility, and the decisive criterion remains controlling their use within the framework of international rules, not redefining their nature. Are these rules sufficient today.?

2) Characteristics of military drones:

It is necessary at the beginning to acknowledge that not all military drones are similar in terms of technological level or degree of development. They may share some basic features, such as the ability to fly remotely or the small size of most of their models compared to traditional aircraft, while there are other huge models equipped with missile systems capable of carrying tons of payload.

Drones also differ in their multiple roles and uses, including operational range, endurance, speed, and the size of the payload that can be carried, in addition to other technical characteristics that may give them additional functions depending on the nature of the tasks required.

Accordingly, military drones are distinguished by a set of distinctive characteristics that qualify them to perform multiple tasks in various contexts, and we present below the most important of these characteristics.:

- **Low economic and human costs:** Unmanned aircraft are characterized by their low economic cost compared to traditional heavy means of combat, whether in terms of acquisition, operation, or maintenance, which reduces the burden of military spending during conflicts. It also contributes to reducing human losses because they are operated remotely and are able to reach remote areas, fly at high altitudes for long periods, and carry out their missions without exposing individuals to direct risks. Thus, they have become an influential tool in the modern balance of power, especially in light of the limited capabilities of some countries to monitor them. And confront it effectively, as they say, when you have the sky, you have victory, because it is an effective element to confuse the enemy as it incurs heavy losses by striking strategic sites, disrupting communication platforms and other intelligence tasks[12] .
- **Efficiency and operational flexibility:** Military drones are distinguished by their high ability to carry out a variety of tasks accurately, with the speed of adapting to different difficult environments and changing goals. For example, when this is combined with renewable solar energy at high altitudes, there is room for continued flight periods of weeks or even months. It is also difficult to understand its path, especially if it relies on advanced artificial intelligence.
- **Autonomy and independence:** Military drones are characterized by their ability to operate according to pre-programming or through artificial intelligence algorithms, while human supervision remains present to varying degrees. The idea of independence here is based on a delicate balance between the human and the robot (the aircraft). The

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human may maintain complete control and his role may be limited to monitoring, reaching cases where the system is delegated to carry out the task almost completely or completely.

This independence comes in many forms. There is a functional independence that enables the aircraft to perceive its environment and adapt to it and take automatic actions such as movement and guidance according to the threat, independence in carrying out tasks without direct human intervention during the operation, and another in decision-making that may amount to setting goals independently. However, the latter remains subject to legal reservation, as the final decision to use force is supposed to remain in the hands of the human. As for what is called legal independence, that is, granting the unmanned aircraft as an intelligent robot legal personality, that is, assuming obligations and acknowledging responsibility, is still An unrecognized theoretical proposition, as legal responsibility remains fixed and assigned to the human element alone[13].

Thus, these characteristics together form the basis for the technical and operational distinction of armed drones, while their use always remains subject to international legal controls.

II. The limits of international accountability for crimes committed by military drones

The nature of armed conflicts has witnessed a qualitative transformation due to rapid developments in war technology, as these transformations have produced new types of means of combat, most notably unmanned systems and drones. This has led to the development of the principles and rules of international humanitarian law in the face of unprecedented challenges, especially with regard to the extent of their applicability to these modern means. In this context, fundamental questions have emerged about how to harmonize existing rules with the technical characteristics of these systems, and whether there is a need to develop new legal frameworks. Respond to its complexity? These developments also raised delicate legal and ethical problems, especially with regard to determining responsibility for the resulting actions and the limits of compliance with the basic principles of international humanitarian law.

Hence, this proposal seeks to clarify the mechanisms of applying the fundamental principles of this law to the use of these technologies, while analyzing the problem of attributing legal responsibility, and reviewing the positions of international jurisprudence regarding these transformations.

1) Principles of using military drones

The development of new types of weapons or the development of their technologies and means of use always requires researching the extent of their compatibility with international law and clarifying their violation of any of those rules. Therefore, the use of drones in wars does not only raise a question about the legality of use, but also about the ammunition used from these aircraft and the mechanism that is used to deliver lethal strikes with lethal missiles. Despite the accuracy of these war robots (drones) in aiming at specific targets, their use is still involved in a legal problem. It seriously addresses real challenges in adhering to the principles of distinction, proportionality, and military necessity in particular.

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The principle of distinction: This principle is one of the basic pillars of international humanitarian law, as it imposes a strict obligation on parties to a conflict to distinguish at all times between combatants and civilians, as well as between military targets and civilian objects. The First Additional Protocol of 1977, supplementing the 1949 Conventions, came to strengthen this principle and expand the scope of protection, so that it includes multiple categories of persons, including refugees, stateless persons, and journalists, who are granted the status of protected persons whenever they fall under the authority of Hostile Party Under customary rules, states are obligated to direct their military operations exclusively towards combatants and military objectives, with an absolute prohibition on any attack targeting civilians or civilian objects, whatever the pretext.[14]

In light of the development of means of combat, especially the use of drones and unmanned combat systems, this principle acquires more complex dimensions, as the operators and programmers of these systems must ensure the accuracy of the distinction between legitimate and illegitimate targets, by relying on reliable intelligence information and accurate algorithms that reduce the risk of error. This also requires taking all possible precautions to avoid harming civilians and protecting civilian infrastructure, including constantly reviewing targeting decisions and evaluating the effects of strikes before implementing them.

Although the principle of distinction is not the result of modern technological developments, but rather constitutes a stable rule in international humanitarian law, its application in the context of drones raises increasing practical and legal challenges, especially in complex combat environments in which civilians are mixed with combatants. Many contemporary incidents have revealed serious violations of this principle, as some attacks led to large numbers of civilian casualties and damage to protected objects, such as mosques, schools, hospitals, and civilian residences, such as what was recorded and seen in the war on the Gaza Strip in Palestine by the Israeli entity, and they amount to war crimes. This raises serious questions about the extent of the effectiveness and effectiveness of compliance mechanisms, and confirms the need to strengthen legal and technical oversight to ensure respect for this principle in modern wars.

The principle of proportionality)[15] Proportionality :(The use of force is always subject to a basic principle in international humanitarian law, which is that it should not deviate from the scope of proportionality. The latter stipulates that military force should not be used excessively, not proportionate to the existing military situation, meaning that if military force is used, all measures and precautions must be taken, and that no party to the conflict has an absolute right to use all means of combat. Rather, they must be compatible with military necessities and the desired advantage. This principle aims to reduce the damage or pain caused by hostile operations, where it must not exceed To inflict excessive damage compared to the expected military advantage, it must include several factors, including the military importance of the target, the density of the civilian population in the targeted location, and the potential collateral effects of the attack, including the possibility of releasing dangerous materials and the types of weapons available to attack the target and their accuracy[16].

This principle is of great importance in the field of the use of drones because it is based on evaluating the argument of military necessity when evaluating the legitimacy of the use of

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armed force. An attack that is expected to result in the loss of civilian lives, injury, or damage to city objects, or to cause a combination of these losses and damages, goes beyond what is expected to result from that attack in terms of a tangible and direct military advantage. Therefore, it includes attacks that are only expected and not certain to cause damage that is not commensurate with the military advantages sought from those attacks. Once again, we see that drones raise serious doubts about their observance of this principle.

The principle of military necessity: This principle of 'military necessity' is also considered one of the foundations that regulate the use of force, as it permits resorting to it only to the extent necessary to achieve a legitimate military goal, without exceeding what is imposed by actual necessity or inflicting unjustified suffering. This principle does not grant absolute freedom, but rather restricts the use of combat means to the fact that they must be linked to a clear and direct military goal, with the exclusion of any actions that do not contribute to achieving this goal.[17]

In the context of the use of drones, the importance of this principle is highlighted due to the latter's ability to carry out precise strikes from a distance, which imposes a high level of scrutiny in justifying their use as it must be proven that resorting to them is the most appropriate option, and that there is no less harmful means that can achieve the same goal, with the need to ensure that the target is military in nature and that neutralizing it achieves a tangible and direct advantage.

The use of this method is subject to three main legal frameworks. Firstly, in the field of maintaining internal order, it is governed by human rights rules that restrict the use of force. Drones are not resorted to except in cases of extreme necessity to confront an imminent threat, with a commitment to gradualness and minimizing damage. Secondly, in the case of self-defense, the use of force must be necessary and immediate to repel an armed attack or an imminent or potential danger, relying on accurate information and precisely defining the scope of the operation. Thirdly, in armed conflicts, the use is subject to the rules of international humanitarian law, where it is required to verify the military nature of the target and achieve an advantage. Direct military action, choosing the least harmful means, while respecting the principle of proportionality[18].

However, despite the technical accuracy that drones provide, they raise real challenges, most notably the possibility of expanding the use of force and the ease of making the decision to strike remotely, in addition to the risks of error in identifying targets. Therefore, respecting the principle of military necessity requires strict oversight and careful evaluation of each operation, ensuring that the limits of legality are not exceeded and the protection of civilians is achieved.

The principle of humanity: Although military drones are one of the most prominent manifestations of development on the battlefield, and the great potential they provide in reducing humanitarian damage compared to conventional weapons, their use remains strictly subject to the principle of humanity, which is the cornerstone of international humanitarian law. The latter imposes clear restrictions on the means and methods of warfare, and prevents the causing of excessive injuries or unjustified pain, whether resulting from conventional weapons or modern systems such as drones. From this standpoint, technical superiority does

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not constitute a justification for overriding humanitarian considerations, but rather holds the user doubly responsible for avoiding unnecessary harm.

In comparison with conventional weapons, which are often characterized by broad and relatively indiscriminate destructive effects, drones provide the possibility of more precise targeting, which is supposed to limit civilian casualties. However, this technical precision does not eliminate the risks associated with the use of explosive munitions or projectiles that may cause serious injuries, including severe wounds or permanent disabilities, whether in limbs or vital organs. Its effects are not limited to fighters, but may extend to civilians in the vicinity of operations, especially in crowded urban environments.[19]

The principle of humanity in this context requires that the use of drones not lead to excessive damage, even in light of the intensity or length of military operations. The criterion is not only in the nature of the weapon, but in how it is used and the extent to which it respects the limits that prevent turning military operations into a source of unnecessary suffering. This includes the necessity of choosing munitions that cause the least harm and avoiding attacks that may lead to widespread disfigurement or long-term effects on the population.

The most prominent contemporary proposals also confirm that technology, despite its ability to reduce risks, may produce new forms of suffering, such as the ongoing psychological effects resulting from permanent surveillance or the fear of sudden strikes, and this expands the concept of humanity to include not only physical or material harm, but also human dignity and psychological safety. Accordingly, the legitimate use of drones remains dependent on the extent of its commitment to the spirit of the principle of humanity, which requires that the purpose of military operations remain limited to achieving legitimate goals, without sliding towards inflicting pain as an end in itself, and in a way that ensures the minimum possible level. Of suffering in all circumstances, and this is what we see recorded today with the violation of international law in front of the eyes of the entire world by the Israeli entity and the psychological and moral damage it has caused to the residents of the Gaza Strip, not to mention the material and structural destruction of the city and the killing of children, women and the elderly without accountability, disapproval or activation of international law.

2) The position of international jurisprudence on the use of military drones

The contemporary international system has witnessed a clear division regarding the legality of the use of military robots, especially drones and autonomous combat systems, as a peremptory international rule that unifies the positions of states has not yet crystallized, despite ongoing discussions within the United Nations for years. In this context, we will clarify the jurisprudential and legal trends regarding its position on the use of armed drones as a type of autonomous combat robot into two main opinions: one direction calls for a preventive ban, and another supports the legitimacy of controlled use.

- **Preventive use of autonomous armed drones:** This trend in the context of autonomous military drones is based on the basic principles of international humanitarian law, which were previously explained, especially the principle of distinction, the principle of proportionality, and the principle of military necessity, as

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well as the principle of humanity. Supporters of this trend argue that these principles, as well-established as they are, are difficult to ensure precise compliance with by autonomous systems, given that these aircraft may operate with relative or complete independence from human intervention, which limits the possibility of direct humanitarian assessment. At the moment the decision is made to use force.[20]

This trend is also based on the idea of the relative legal vacuum that exists, as autonomous drones may make decisions of a lethal nature without immediate human supervision, which raises profound problems related to the attribution of international criminal responsibility: Is it attributed to the military commander, or to the state, or to the programmer or manufacturer? This is a situation that, in their view, may lead to the weakening of the international accountability system. In addition, this trend warns that the expansion of the deployment of these systems may contribute to destabilizing international stability and open the door to an uncontrolled technological arms race, in which countries race to possess advanced autonomous combat capabilities.

However, this proposal has not been free from criticism and opposition, as opponents of the preventive ban believe that a mere ban does not necessarily mean limiting the spread of this technology, especially in light of the competitive nature of the international system. Also, imposing a comprehensive ban faces practical and legal difficulties, in light of countries' adherence to their sovereignty and the absence of a central international authority capable of binding and implementing. In addition, some contemporary international crises, including ongoing conflicts such as the conflict in Palestine, have weakened, in the eyes of some, confidence in the effectiveness of international institutions such as the United Nations in imposing or implementing uniform standards. Without duplication.

In this context, major countries such as the United States of America and Russia oppose the trend of a comprehensive ban, justifying their position that their military policies require, in principle, that a degree of human control remain over the use of autonomous systems, ensuring that they do not deviate from the legal framework. These countries also see that the call for a ban is premature, and may lead to obstructing legitimate development in the field of military artificial intelligence, in addition to the fact that it may impose excessive restrictions that are not commensurate with security and defense requirements. On the other hand, broad calls have emerged from an elite group of scientists, engineers, and experts. Artificial intelligence, as well as specialists in the field of robotics, calls for the need to direct this technology towards peaceful uses, and to establish strict ethical and legal controls to ensure that its development and use remains in the service of humanity, and not a tool to undermine it [21].

- **Supporting the legality of the controlled use of autonomous armed drones:** This trend in the context of autonomous military drones stems from the fact that international humanitarian law does not prohibit a means of combat itself, but rather regulates how it is used. Therefore, these systems remain legitimate as long as they respect the principles of distinction, proportionality, and military and humanitarian necessity. This

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proposal is based on the new weapons review rule stipulated in Article 36 of Additional Protocol I, which obligates states to evaluate the legality of newly developed weapons before using them. Several countries, such as the United States of America and China, have adopted it. Russia, the United Kingdom, France and South Korea have national mechanisms to review these systems, reflecting a trend towards their legal integration..[22]

Supporters of this trend also see the possibility of programming artificial intelligence systems to respect the rules of international humanitarian law, so that violence is not used except within the limits of military necessity, which may contribute to reducing human errors and increasing the accuracy of operations.

However, this trend faces important criticism, as the assumption of technology accuracy is not absolute, but remains relative, especially in complex environments in which it is difficult to predict the behavior of autonomous systems themselves, and programming legal frameworks collides with technical and ethical problems due to the difficulty of translating flexible concepts such as proportionality into precise algorithmic standards.

It is also feared that this trend will lead to expanding the scope of the use of these systems outside armed conflicts, to include controversial areas such as assassination operations or combating terrorism. Their spread also raises the risk of their transfer to non-state actors, which increases the complexity of security and legal challenges.

Therefore, despite the validity of this trend, it still needs more stringent guarantees, especially with regard to human oversight and the development of complementary international rules that control the use of this technology[23].

By extrapolating these two trends, it becomes clear that they are based on different foundations that reflect, in essence, a duality between the political dimension and the humanitarian consideration. The trend calling for a preventive ban is based on a precautionary moral logic that aims to avoid potential risks to autonomous systems. However, it clashes with the reality of international sovereignty and the divergence of states' interests. On the other hand, the trend in favor of controlled use reflects a kind of legal pragmatism, as it seeks to accommodate this technology within existing frameworks. However, this may sometimes lead to emptying humanitarian rules of their actual content. The essence of the problem from our perspective does not lie in the dichotomy of prohibition or permissibility, but rather in the necessity of rebuilding a more legal system. Appropriateness, based on a clear definition of the rules of responsibility, and strengthening the principle of actual human control, in a way that achieves a balance between the requirements of international security and guarantees of human protection.

3) International liability for damage to military drones

It goes without saying that international responsibility is one of the basic pillars of public international law, and it arises when two elements are present: an internationally wrongful act in the sense of violating a rule of public international law, or attributing the act to a person of international law. In the context of drones, this liability is raised when they are used in violation

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of the rules of international humanitarian law, especially if they result in unlawful targeting of civilians or disproportionate damage. However, the specificity of this technological means raises new problems, related to the nature of the actor and the distribution of roles between the human and the robot.

The basis of international responsibility in the use of military drones:

The established rule in public international law remains that the state bears responsibility for all actions of its agencies, including technological means used in military operations, without regard to their nature or degree of development. Accordingly, the use of unmanned military aircraft, whether remotely piloted or autonomous, does not deviate from the scope of this rule, but rather remains subject to the provisions of international responsibility whenever it results in a violation of the rules of international humanitarian law, especially with regard to the protection of civilians and civilian objects.

This perception is based on the fact that international law does not distinguish between combat means, but rather subjects them all to the standard of legality related to the method of use. If drones are employed in operations that target protected persons, or lead to disproportionate damage, then this is considered an internationally wrongful act, which entails the responsibility of the state, regardless of the fact that the decision was taken by a human being or with the support of an intelligent system. Also, the state's development or acquisition of these systems without subjecting them to prior legal review, as required by the rules of international law, may constitute a limitation. itself in violation of its international obligations.

The scope of this responsibility is not limited to actions occurring within the territory of the state, but rather extends to include cross-border operations, where the use of drones in the territory of another state raises the issue of respect for sovereignty, which is one of the fundamental principles of the international system. If this use takes place without a valid legal basis, such as in the case of legitimate defense or with the approval of the concerned state, it may be considered an internationally wrongful act, requiring responsibility and its consequences, such as compensation or a commitment not to repeat, along with the legitimacy of self-defense by the state with defense systems, and a living example of this is the drone without A pilot who crossed the borders of the Algerian state's sovereignty from the state of Mali on the borders of the African coast, and the Algerian army acted to shoot her down immediately[24].

However, the problem does not lie in denying the existence of responsibility, but rather in the weakness of its activation at the practical and applied level, as it remains subject to political considerations and international balances, which often leads to the absence of actual accountability, especially when it comes to major countries that possess this technology and control the mechanisms for enforcing international law.

The difficulty of assigning international responsibility in light of autonomous armed drones

If the assignment of responsibility in the traditional style does not raise a major problem, the matter becomes more complicated with the emergence of autonomous drones, which rely on artificial intelligence algorithms in decision-making, including decisions to use force. In this

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case, military action is no longer the product of direct human will, but rather the result of the interaction of digital data and algorithmic processing, which poses a real challenge to the traditional rules of responsibility.

The most prominent of these challenges is what is known as the 'responsibility gap', as it is difficult to precisely determine the person to whom the harmful act is attributed. Is the military commander held responsible despite his lack of direct intervention in the decision? Or is it attributed to the state as the holder of public authority and control? Or does it extend to the programmers and designers who developed the algorithms? This overlap in roles leads to diluting responsibility rather than defining it, which may open the way for impunity.[25]

In an attempt to overcome this problem, contemporary jurisprudence has tended to adopt a flexible concept based on multiple levels of responsibility, such that the state remains responsible for the general use of the system, while individuals can be held accountable when error or negligence is proven. It is also possible, within a limited scope, to raise the responsibility of technical authorities in the event of serious design defects. However, this proposal still faces practical difficulties, especially in proving the causal relationship between the technical defect and the harmful result.

Relying on autonomous systems also raises deeper problems related to the possibility of subjecting the algorithmic decision to legal standards, especially since concepts such as proportionality and military necessity are based on flexible human assessment that is difficult to translate into rigid digital standards, which reinforces the proposition that it is necessary to maintain the element of actual human control as a basic guarantee to prevent these systems from deviating from the requirements of the law.

Accordingly, the development produced by autonomous drones does not negate the establishment of international responsibility, but it requires a reconsideration of the mechanisms for attributing and activating them, in a way that is consistent with the complex nature of this technology. The real challenge is no longer in the existence of the legal rule, but rather in its ability to accommodate the new actor, i.e. the “smart robot,” without this leading to undermining the principle of accountability, which is the cornerstone of the international legal system.

Conclusion

At the conclusion of this study, it becomes clear that the rapid development in military drone technology did not create a legal vacuum as much as it revealed a relative deficiency in the ability of traditional rules to keep pace with contemporary technical transformations. International responsibility still exists in principle, but the complexity of the actors and the overlapping roles between humans and robots coupled with artificial intelligence have created unprecedented challenges in assigning and activating them. The international division between the logic of prohibition and the logic of controlled permissibility reflects a conflict between humanitarian considerations and political and security stakes, without To lead to a final solution.

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Accordingly, the basic conclusion is that international law is going through a transitional phase that requires rebuilding its tools, not replacing them. From this standpoint, the following can be recommended:

•The necessity of enshrining the principle of actual human control as a binding legal condition in all stages of the use of autonomous aircraft .

•Working to develop a special international framework that clearly defines the rules of responsibility for actions issued by smart systems, in a way that prevents impunity and enhances human protection in armed conflicts.

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