



الائتلاف العسكري لمحاربة الإرهاب  
ISLAMIC MILITARY COUNTER TERRORISM COALITION

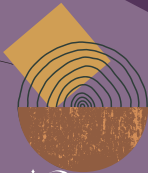
# DRONES: (UAVS) TERRORIST GROUPS' ARMS RACE

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TERRORISM  
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## **DRONES: (UAVS)**

### **TERRORIST GROUPS' ARMS RACE**

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Drones have proliferated in recent times, and are used in most fields, including children's toys. Nonetheless, they have attracted more attention in the Russia-Ukraine war. Their use went far beyond regular armies to become available to terrorist groups, posing a menace to all countries of the world. However, what sparked controversy was the terrorist groups' use of drones to carry out terrorist attacks, reconnaissance, and smuggling operations. Using drones, terrorist organizations – such as Daesh, Hezbollah, the Houthis and the likes, carried out numerous terrorist operations in the past years. These groups used drones to target several strategic locations in the Middle East, including military bases, oil depots, and airports. Those attacks by terrorist groups have prompted many countries to strengthen their defensive and offensive strategies to deal with potential threats.

It is for this reason that drones have become a major feature of terrorists' fighting strategy. Shortly after the rise of Daesh in 2014, it began using drones as an essential part of its military operations to expand its territory. Along with the group's use of drones, as a direct military tool, to drop ammunition or carry out reconnaissance operations, they also used them as a tool of propaganda, as an indirect means to bolster itself. For instance, Daesh used drones to shoot video clips that show its fighters while carrying out suicide bombings, and then used these clips for propaganda purposes to boost the morale of its fighters and recruit new terrorists.

On the other hand, Al-Qaeda was much less active in the use of drone technology compared to Daesh. Nevertheless, the former Syrian affiliate of Al-Qaeda, now known as Hayat Tahrir Al-Sham (HTS), was the exception, especially when it comes to the use of drones as a tool of media and propaganda. In January 2018, HTS armed men carried out a notorious attack with a squadron of drones on a Russian base in Syria, using homemade drones assembled from a small engine, fine wood, and a number of small rockets.

In addition to the abovementioned groups, the Lebanese terrorist group Hezbollah and the Houthis in Yemen used drones to attack various targets. The terrorist Hezbollah carried out several attacks against Israeli targets using Iranian-made drones. For example, in July 2017, Hezbollah launched three Iranian drones against Karish offshore gas field that lies between Israel and Lebanon.

Not only the drones used by the Hezbollah were manufactured in Iran, but also Iran had trained Hezbollah fighters on how to use this type of aircrafts in its camps inside Syria. Furthermore, the Iranians trained Hezbollah fighters on how to assemble drones after they had been smuggled from Iran via Syria.

Hezbollah, in return, provided training to the Houthi militia in Yemen on how to assemble Iranian drones and use them to carry out attacks. Therefore, we should first understand the emergence of drones and the stages of their evolution for military purposes, and identify their strategic, tactical and military impact. Similarly, we should explore the evolution of the fighting tactics of the terrorist groups, highlight the risks of drones use by terrorists, look into their uses by terrorist organizations, and assess the future risks of their use by terrorist groups. We should also explore the detection systems of drones, and finally identify their role in future wars.





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## Emergence of Drones and the Evolution of their Use Militarily

Drones have brought about enormous changes to the evolution of warfare including human, financial costs, time, place, and the concept of power. Drones have emerged as multi-functional weapon, for which countries and armed groups around the globe, compete to acquire. Their significance keep going up as countries seek to be able to develop, acquire, and export them.

Drones are one of the most advanced means of warfare and the desire to possess them increases by the day, their development is ongoing due to their low material cost and human-energy saving. They piloted remotely as several individuals in a small room can control squadrons of UAVs.

From a military point of view, militaries have come to prefer attack drones because of their ability to strike targets easily and accurately even from high altitudes, based on a certain software on which drones are programmed. In case of their destruction or targeting, their loss is far less, compared to a conventional warplane.

The point is that this type of aircraft is an offshoot of the constantly evolving artificial intelligence whose multiple uses are not limited to the military domain, but rather extend to cover various civilian tasks such as photography, delivery of orders, aerial survey and agriculture. They also possess high capabilities to adapt to volatile and turbulent environmental conditions.

The United States used UAVs in the early seventies of the last century, specifically during Vietnam War and the fighting that took place in jungles, known as guerrilla warfare, a situation that required drone

use, which eventually played a significant role in tilting the balance of that war.

Drones differ from conventional combat aircraft in several ways, most importantly in term of is their small size, the low payload of the ammunition they carry. However, this deficiency in the payload of ammunition is offset by the increasing effectiveness of the explosives they carry on board in addition to lethal and destructive capability. The ability of the drones to be operated remotely gives them a high degree of maneuverability. While the range of conventional aircrafts is almost limited; drones can fly at a slower speed, consume less fuel, which, according to military technicians, is an advantage rather than a disadvantage, as it can hover in the air for a long time, giving it broader effectiveness in achieving its mission. Hence, one can argue that the search for targets and firing are the two primary functions of military drones nowadays.

The first drone appeared in England in 1917, and later developed in 1924.<sup>1</sup> Since World War I, the United States, Germany, and the United Kingdom were the first countries to use drones in their armies. Later, in the thirties of the last century, the former Soviet Union caught up with them. The Second World War (1939-1945) and the Korean War (1950-1953) opened the way for a wider use of the drones by the United States for training purposes, as guided missiles, and in countering manned combat aircrafts. For each of these purposes, a drone was only used once. That is why a factory in Southern California produced about 15,000 drones. On the other hand, drones intelligence role emerged after Vietnam War 1955-1975.<sup>2</sup> Similarly, drones also featured in the attack on Kosovo in 1999, where they were equipped with missiles for the first time.<sup>3</sup>

Subsequently, due to the continuous evolution of their manufacturing, and the growing demand, the global expenditure on this industry is expected to exceed \$100 billion by the end of 2019<sup>4</sup>. This is particularly so, given the fact that many countries aspire to develop drones to replace their crewed combat aircrafts that are equipped with missile, including nuclear ones. Among the countries competing in this field are the United States and Israel, as major global producers of drones and therefore dominate, and control their market, especially Israel as a major drone exporter.<sup>5</sup>

## UAVs components

UAVs manufacturing companies use the following components<sup>6</sup>:

### ► Drone fuselage:

The drone fuselage is made from plastic or carbon fiber, and is designed according to the aircraft arms model (triple, quadruple, sextuple, or octuple). The end of each arm carries an engine and a propeller, while the center of the aircraft carries the flight control instruments, the electronic stabilization arm of the camera (to make the camera independent of the drone's movement) and the rest of the equipment. The bulk of the weight is concentrated in the center of the aircraft to maintain the advantage of the central balance point, as the weight is very important for all parts of the drone. While, the heavier the frame, the lower the altitude achieved by the aircraft. However, the frame should not be very light for the aircraft to remain strong, and it is for this reason manufacturers use carbon fiber because it combines strength and lightness.

### ► Drone Flight Controller

Is used to control the drone, as it transmits navigation information from a wireless control board. In highly advanced systems, the flight controller can be pre-programmed for the drone to fly autonomously.

### Transceiver

The transceiver connects the drone and its controller. The transmitter contacts the control unit of the drone, inputs information, and then generates commands to the engines. The choice of

transmitters is highly important, and the selection of the transmitter depends on the number of channels needed for operation.

The minimum number of channels in a multi-engine drone is four channels (for operation, tilt, yaw, and speed). Having more than four channels is an advantage, as a separate channel can be used for the autopilot, another for operating the camera, and a third for landing, etc.

### ► Engines

There is an independent engine for each arm. The functions of the engine depend on the power and the function required from the motor. Thus, when a drone is built with multiple engines to carry a heavy payload and achieve the best flight time, then a higher torque motor with less revolutions would be ideal. However, other purposes may require a fast, powerful, and maneuverable system with a fast-revolving engine. The RPMs measurement is linked to the KV value. Faster drones reach 1400 KVs, while slower ones with longer battery life reach a range of 300-900 KVs. Representation of these numbers is true only if the battery is compatible with the drone propellers.

### ► Propellers

As drone wings, propellers are made from plastic or carbon fiber. When choosing propellers for a drone, the propellers have to be proportionate to the size of the drone.

The propellers come in pairs, one of them rotates clockwise and the other rotates counterclockwise. The drone's power source is batteries, which come in a wide range of weights and capacities. It is better to choose a battery with a larger capacity to ensure a longer flight time. However, this is not always true, because an increase in the battery capacity means more weight. That is why an increase in capacity reaches a limit, after which such an increase becomes of little use.

### ► E-speed control unit

When it comes to control, this unit is the most important part: it is responsible for engines operation. The e-speed control unit determines



the value of current that stably goes to the engine system. Moreover, because engines run at different speeds, they require a control unit to set those speeds.

If all the engines spin at the same speed, the plane would always keep hovering in the air. So, by changing the speeds, we control the plane's movement. In the case of drones, controlling the tilt of the aircraft cannot be achieved by controlling the tilt of the rotatory arm, but rather by controlling the differences in the speeds of the engines. It is better to use four identical e-speed control units.

### **Military strategic and tactical effects of drones:**

Israel military introduced the drone in October 1973 war, and used them to shoot down 28 Syrian fighter jets. However, it failed to use them against the Egyptian army because of the air defense system, known as the "missiles wall" that Egypt possessed at the time. The drones were used again in Lebanon War of 1982, where they managed to neutralize the Syrian (ground-to-air) missiles in the Bekaa Valley of Lebanon<sup>7</sup>. The critical role that the Pioneer aircraft played in Lebanon War of 1982 and strongly motivated the United States to purchase and integrate it into the American military hardware that took part in Operation Desert Storm to liberate Kuwait from the Iraqi forces in 1991. Meanwhile, the Predator, the Global Hawk surveillance drones, and the Raven (the smallest and least expensive one) played crucial roles in operations carried out by the United States overseas in the past and current decade of this century<sup>8</sup>.

These two UAVs and other drones have become an integral part of the American military equipment. In the first decade of this century, their number in the US army increased to more than 7,000 aircrafts (their number before the 9/11 attacks did not exceed 200 aircrafts).<sup>9</sup> The importance of their multiple and diverse roles has emerged since the US Army began to use them, equipped with weapons, in Afghanistan war of 2001, Iraq war in 2003, against al-Qaeda, and in Yemen. The CIA also used drones in Pakistan in 2004<sup>10</sup>.

Drones have provided many solutions to the human, material risks and costs related to land, sea and air military operations. Additionally, they provided high combat features and electronic technologies by carrying sensitive sensors and high-definition cameras. Their technological advancement enabled them to reach altitudes of up to 33,000 feet, with energy-storing capability that sustains 40 hours of continuous flight<sup>11</sup>.

In Afghanistan in 2010, the American forces used drones to acquire five hundred hours of high-definition photos and videos of Afghanistan's territory, which enabled the US forces to distinguish regular farms from poppy ones<sup>12</sup>. Therefore, the experience of using drones in Afghanistan war made a fundamental strategic and tactical shift in comparison with what armies have achieved on the ground, by means of surveillance, tracking, and targeting in a single mission.

In Yemen, between 2012 -2015, the drone air raids carried out by the US army, degraded the ranks of the Ansar Al-Sharia group, an affiliate of Al-Qaeda in the Arabian Peninsula, by eliminating the most prominent leaders of this group, at the least human and financial cost, thus achieving what human forces were not able to achieve on the battlefield<sup>13</sup>. In 2017, drones' air raids in Yemen reached 176.<sup>14</sup>

Between 2007 and 2009, the US drones in Iraq carried out about 476 raids. These raids played a major role in the withdrawal of the major part of the US ground forces in 2011. However, this withdrawal was offset by doubling the activity of continuous drone flights in the Iraqi airspace throughout the years that followed the withdrawal. The situation in Iraq is not different from that in Afghanistan.<sup>15</sup>

### **Defensive tactics of terrorist groups**

The use of drones is no longer limited to regular armed forces. Terrorist organizations possess this type of aircraft given that they possess airpower and are able to achieve a military advantage that enables them in terms of reconnaissance and attack. This technology has been available to many terrorist organizations, including Daesh and other terrorist groups in Latin America. Such groups' interest in

drones is due to their easy purchase, low cost, high accuracy, operational flexibility, and high defense capabilities.

Daesh, for instance, used drones to launch a wide range of attacks in Syria and Iraq. According to the US Central Command, Daesh, used drones in its battle for the liberation of Mosul that could be easily purchased from websites and online stores. It also used quadcopters in surveillance and in dropping of explosives on the Iraqi forces. We can notice that the emergence of new drone tactics by terrorist organizations multiply their threat, as a UAVs swarm attack on a specific target could force anti-air defenses to destroy them. In 2018, the attack on the Syrian Hmeimim Air Base, currently operated by Russia, has demonstrated the ability of the terrorist armed organizations to carry out training and development in the uses of this technology. The Russian Ministry of Defense reported an attack by a swarm of about 13 drones, one of which was equipped with a camera to monitor and correct their trajectory, while the rest of the drones were loaded with 400 grams of explosives, equipped with metal balls capable of hitting their 50-meters-distant targets. Warnings against such attacks are still persistent. In the 2020, the commander of the US Central Command, Kenneth McKenzie, warned that US forces in the Middle East were not adequately prepared to defend themselves against swarms of tiny drones.<sup>16</sup>

Many drone terrorist attacks and reconnaissance operations took place in Iraq. In 2021, 10 drone attacks were launched on targets in Iraq:<sup>17</sup>

**On March 4:** Drones penetrated command compounds in Baghdad and Erbil.

**On April 14:** An American aircraft hangar was bombed in Erbil International Airport.

**On April 28:** A site of the International Coalition against Daesh was bombed.

**On May 8:** Assad Air Base was attacked.

**On May 11:** A strike was launched on the International Coalition site near Erbil.

**On June 6:** Assad Air Base was attacked by two drones.

**On June 9:** A strike was launched on the International Coalition site in Baghdad International Airport.

**On June 15:** International Coalition site in Baghdad International Airport was attacked by two drones.

**On June 20:** Assad Air Base was attacked.

**On June 27:** A strike was launched by 4 drones near the command compounds in Erbil.

### Uses of drones by terrorist organizations

**Terrorist groups use drones in several fields. However, regarding their use in military operations, the uses of drones could be divided into two types:**

**Offensive use:** Drones are equipped with explosive devices to serve as time bombs to target military or civilian sites. In August 2022, the authorities in the Republic of Mali announced the death of 42 Malian soldiers in an attack launched by Daesh in the Sahara using drones, artillery, and explosives-laden trucks.<sup>18</sup>

Terrorist organizations have also demonstrated high competence in using drones. In 2016, the Somali terrorist Al-Shabaab movement used drones laden with explosive devices to launch attacks on Somali government facilities. It is worth noting that the Somali Al-Shabaab movement also used drones to attack a military base in 2019.<sup>19</sup>

In June 2013, the Iraqi security forces arrested an ISIS cell on charges of planning to use remote-controlled drones to spray sarin and mustard gases on unspecified targets in Iraq and other regions. In January 2018, a terrorist group in Syria attacked a Russian army base in Tartous, Syria, using 13 primitive drones laden with explosives.<sup>20</sup>

**UAVs Use for military reconnaissance:** Terrorist groups employ drones for the purposes of surveillance, propaganda, and arms transport. This is the most widely used type of UAVs by terrorist groups. In January 2022, Daesh in West Africa used drones to film parts of a propaganda video showing its training camp in Nigeria.

In July 2022, ISIS-use of reconnaissance drones were also spotted over the location of the Nigerian





government forces before they could carry out their terrorist attack. The New York Times reported that the Nigerian Boko Haram group had obtained drones, and that this group had planned to use them for intelligence purposes, with experts confirming that the drones used by the Boko Haram might be more sophisticated than those used by the Nigerian government.<sup>21</sup>

## Risks of terrorist threat

There are several reasons that account for the growing fear of the recent use of drones by terrorist groups, as follows<sup>22</sup>;

**1. International warnings:** International warnings have went up against the use of advanced technological techniques by terrorist organizations, particularly drones, which are on the rise in view of the proliferation of civil wars and the fragility of some governments. These concerns were further exacerbated by the statements of the Indian permanent representative to the United Nations, Ambassador Ruchira Kamboj, who confirmed that drones have been used in launching attacks in many conflict zones. At the end of October 2022, the two-day meeting of the UN Security Council's Counter-Terrorism Committee in India, wh, concluded with the adoption of a document calling on member states to prevent and combat digital forms of terrorism, especially the use of drones, social media and the financing of terrorism via the Internet.

**2. Availability of drones:** The amateur drones global market is expected to reach about \$43 billion by 2024. Commercial drones are widely available, with ease of manufacture at such a cost that may not exceed hundreds of dollars, hence enabling some organizations to acquire them easily, and may make technical modifications to them for use as guided weapons. Characteristically, these aircrafts are difficult to identify and shoot down by many defense systems in view of their low altitude flight, relatively slow speed, and the possibility of purchasing some drone models and arming them for less than \$ 650.

There are also many methods through which terrorist groups can obtain drones, including acquiring them through a third party, such as organized-crime

gangs. Some types of drones can also be purchased from online stores.

**3. Threats to infrastructure:** The Russia-Ukraine war has revealed a heightened use of drones in targeting strategic infrastructure, such as communication networks, power plants, airports, and so forth. Therefore, it is expected that terrorist groups will use them in attacking critical infrastructure.

## Drones in future wars

The conflict in Ukraine has provided a number of lessons, which will inevitably influence the decisions of military policymakers, military commanders, and military manufacturing companies regarding the future of drone capabilities. As the conflict in Ukraine continues, new lessons may be learned and for sure will offer more lessons in terms of the following points:<sup>23</sup>

**1. The low cost of these drones vis-à-vis the great military capability they provide, will heighten countries' race to buy them from militarily advanced countries or to manufacture them all by themselves.** Drones are very cheap compared to other expensive combat aircrafts that may also be subject to interception, destruction along with the loss of pilots on whose training countries invest and pay high cost. When it comes to comparison with ballistic missiles that are also very expensive and most of them can be intercepted, especially those with subsonic speeds -by especially designed air defense systems.

**2. The multiplicity of air and land tasks that drones perform in times of peace and war:** Drones provide an opportunity for engagement with the enemy's front lines to facilitate the advance of ground troops and reduce their human and equipment losses; they also drop missiles and bombs to destroy the enemy's supplies, ammunition depots, and reserve forces. Drones could also substitute traditional reconnaissance aircraft in carrying out unique and different tasks as they become capable of forward sensing, which means that they will fly ahead of reconnaissance warplanes to scan combat areas, collect information about hostile troops and, at the same time, conduct electronic warfare by jamming

enemy radars, electronic devices, and air defense systems.

**3. Drones have introduced air supremacy:** The role of drones has become more revolutionary in depriving the enemy from achieving air supremacy on the battlefield. Russia, for instance, struggled to impose air supremacy over Ukraine, but the drones prevented it from obtaining absolute air supremacy in the Ukrainian skies. Of course, this complicated the tasks of close combat support for the Russian ground forces, especially in Kiev, and forced the Russian Air Force to fly at high altitudes. The advantage of drones is that even if the enemy succeeds in destroying all the runways, the drones can still fly from anywhere, needless of especially equipped runways to take off. It is likely, then, that advanced countries in manufacturing of drone could also enable drones to contribute to the creation of air minefields, where the drones fly and target all types of nearby aircraft with a barrage of explosives and shrapnel. This will enable them to create an effective, overhead air defense system.

**4. Although some countries have developed specialized air defense systems against drones, future air defenses are required to keep pace with the continuous development of drones:**

Until now, dealing with drones is mostly done through traditional defense systems, such as Patriot or THAAD, that are highly expensive compared to the cost of the drone. Therefore, it is likely that investment in anti-aircraft defense industry against the drones will come on the agenda of the world defense industries in the upcoming years. Most likely, laser weapons will appear as the next generation of arms technology that armies will develop to counter the growing threat of drones, in which China currently seems to be ahead.

### Drones' detection systems

Both regular armies and private arms industries have admitted that the rapid technological development of drones prompted them to develop drones' detection and confrontation systems. In the United States, the FAA has realized that drones have become widely available for corporate and

personal use, and that there is currently no system for tracking and disengaging airborne platforms. So much so that it has proposed rules stipulating that drones that exceed a certain weight should be equipped with a transceiver to enable tracking. Unfortunately, as with most tracking devices, these systems can easily be disrupted.<sup>24</sup>

Airborne drone detection is critical. It is divided into four categories: RF analysis, acoustic sensors, optical sensors, and radar. **First**, RF analysis monitors the radio frequency spectrum and detects the signals by which drones are controlled. However, RF analysis systems are unable to detect pre-programmed or fully autonomous drones, making them more difficult to detect in densely populated areas, where the spectrum becomes noisier and more crowded.

**Second**, acoustic sensors could either have a single microphone or multiple microphones that detect the sound of the aircraft's high-speed engines or the drone's blades that move in the air.<sup>25</sup> They are limited in noisy environments and have a range of less than 1,640 feet (500 meters). A drone traveling at 80 mph (129 km/h) will cover 328 feet (100 meters) in just under 3 seconds, or at 15 mph (24 km/h) in less than 15 seconds.<sup>26</sup>

**Third**, visual detection is the use of video cameras and computer algorithms to detect the drone. These systems are subject to high rates of false alarm and limitations in low light or on weather interference.<sup>27</sup>

**Finally**, the radar is the primary means of long-range detection. Drones can be detected at a range of up to 1.9 miles (3 km) and within the line of sight. The radar is able to detect small, low-flying drones despite the difficulties encountered in highly cluttered environments. Most radar systems are unable to distinguish between a fighter aircraft and a drone. However, advanced millimeter-wave radar systems can make this distinction by detecting the rotation of the drone's rotor blades. Acoustic and radar detection will become more difficult with the increased use of nature simulation and synthetic blade flight systems, which will reduce noise and remove hard surfaces and the blade rotation that could be detected by radar.<sup>28</sup>



Research in underwater drone detection relies largely on listening for changes in the surrounding background noise. Researchers believe that the passing drone will cause significant changes in the activity of marine life and alter the noise levels. Implementing these systems requires the placement of arrays of hydrophones. As with the detection of airborne drones by acoustic systems, detection by hydrophones will be hampered by noisy environments, such as ports and crowded waterways.<sup>29</sup>

### Counter-Terrorism Approaches

Drones pose a challenge for counter-terrorism due to the lack of sufficient expertise in combating drones or artificial intelligence, amid the failure of analysts and experts to anticipate how terrorist groups will use emerging technologies. The failure of expectations, added to the low cost of - and easy accessibility to - artificial intelligence technology have created a growing threat to the countries of the world. Therefore, there is an urgent need for actions and policies that fall under counterterrorism policies into two categories, both of which have drawbacks: defenses and banning.

**First:** Boosting air defenses against drones. This includes the enhancement of existing anti-drone and anti-AI capabilities, improvement of training for local law enforcement, and the development of plans to reduce accidents of drones or autonomous weapons. Artificial intelligence and technological systems play an important role in this field, including the development of anti-AI tools. However, counter-AI defenses could be costly and their implementation could require countless cities around the world, requiring the expenditure of billions of dollars on electronic and kinetic countermeasures. Additionally, the effective setup of defenses will likely take a long time, which could expose the air cover to the constant risk of drones.

**Second:** Banning the use of artificial intelligence in the army, based on the UN-approved international treaty. This strategy has been taken up by activist groups such as the Campaign to Stop Killer Robots, while leading AI researchers have published open

letters in which they warn of the danger of weaponized AI. However, it is unlikely that the superpowers will refrain from developing AI weapons, while their use in the military field may be prohibited. The international community could also consider banning or delegitimizing AI and lethal autonomous weapons in a way that is sufficient to deter terrorist from using them. Although terrorist groups have proven firm willingness to adapt to modern technology and its uses, there is an extensive list of weapons – such as chemical and biological weapons, cluster munitions, barrel bombs, and more - that are accessible to terrorist organizations but are rarely used. This is partly because of the international stigma associated with these munitions: if the rule is strong enough, terrorists may avoid using the weapon. However, standards take a long time to develop; they represent fragile and mistrustful solutions. Clearly, good counter-terrorism options are limited.

Non-governmental actors are already deploying drones to attack their enemies. Lethal autonomous weapons systems are likely to be widely available to terrorist groups, which might lead to dire consequences. It is, therefore, important to urgently address this growing threat by preparing stronger defenses against drone attacks and potential squadrons, engaging with defense industry and AI experts who warn of the threat, and supporting the pragmatic international efforts to ban or stigmatize military AI applications. Despite the low probability of such an incident, a killer robot attack can cause huge losses, deal a devastating blow, and cause panic. The threat is imminent, and it is time to act.<sup>30</sup>

### Drones' compliance with the law

The legal and political community, information technology, and AI technology have not ignored the issue of drones. Their role is to set the necessary rules and laws to address legal gaps and deal with the serious violations that impact on the safety and security of societies and the security and stability of the state. The state defense system maybe undermined because of the violations committed when using modern technology including, for example, drones, especially armed ones, in use by

regular armies, under the pretext of confronting terrorism. These planes have claimed the lives of many innocent people with a press of a single button, only to fall victims of wrong decisions cloaked under “counterterrorism.”

If we examine the international humanitarian law, we will find a battlefield of rival political interests that covers the whole world. The principles of distinction, proportionality, and exalted humanitarian principles have been disrespected. The air bombing of civilians has become normal under the pretext of searching for terrorists, and the attack whose result should concur with the realization of the desired military advantage is not considered.

Drone air strikes may encroach upon many values and principles, whether in the public international law, international humanitarian law, or human rights. This raises controversy about the legality of air warfare following the suffering of humanity from many calamities as a result of the indiscriminate use of drone weapons, despite international calls to comply with the law of war for each new weapon in accordance with article 36 of the Additional Protocol to the Geneva Conventions of August 12, 1949. The article on new weapons states: “Any High Contracting Party, when studying, developing or acquiring a new weapon or a tool of war or a method of war, shall verify whether this is prohibited in all or in some cases according to this Protocol or any other rule of international law.”

In terms of accountability, the painful reality testifies that the violation of the rules of accountability takes place on two levels. First, the verdicts of arbitrary execution by the world police without determining the accountability of targeted or sniped civilians who were, at best, considered part of the collateral damage. Second, following the incidence of armed aircraft violations, we have not seen any sufficiently transparent investigation in which the party responsible for the transgression has been identified, prosecuted, and punished, despite the many cases of lack of transparency and caution in targeting.

Thus, pointed killing by armed drones has become,

in the eyes of its perpetrators, an easy practice, which they justify as a “necessity”, without observing any controls of necessity, whereas the use of drones should remain subject to the provisions of international humanitarian law. To argue otherwise, even for reasons of military necessity, would undermine the principles of international humanitarian law. To be sure, the use of armed drones is predicated on the compliance with international humanitarian law.

If the principle of necessity can be taken meaningfully, in all cases there is no necessity that requires the commitment of hostilities against civilian non-combatants and their assets, and against prisoners of war, the sick and the wounded. This is the subject matter of the rules of international humanitarian law. Therefore, it is necessary to stress that it is not permissible to use drones for pointed killing— out of respect for human dignity and legitimate trust.

The principle of military necessity amounts to an exception to the general provisions and rules of international humanitarian law. The basic function and objective of this law is to restrict the use of weapons and make war more humane. Any exception to these rules cannot be subject to over-interpretation; otherwise, it would be a violation of the rule of law. When the idea of military necessity is raised, it is important to exercise caution and observe other principles of international humanitarian law.

As understood by contemporary civilized people, military necessity stands on the necessary measures that are indispensable for securing war objectives. The principle of military necessity is generally intended to justify recourse to the use of this limit of necessary force to ensure rapid military defeat of the enemy. The St. Petersburg Declaration that dates back to 1868 stated: “The only legitimate aim that states should strive to achieve in war is to weaken the enemy’s military forces.”

The successive technological developments in unmanned aircraft industry also turn our attention to the potential violations that we must address. Autonomy and pointed targeting, which are likely to be a reality within a few years, will highlight



the most difficult concerns when the relationship between man and the machine becomes direct. Such relationship implies the generation of many possible consequences, whether in terms of increased infringements or in terms of the lack of foresight and caution on the part of the decision-maker, and even increased targeted killing, not to mention the disjunction between murder and trial.

We should end up by saying that the international community must put accountability and transparency into action, comply with international humanitarian law, and enact the necessary national laws to regulate the use of drones in accordance with the law and obligations of states. It should similarly maximize the role of criminal justice in the face of the gross violations of humanitarian law when using unmanned armed drones.

## Conclusion

Terrorist groups have begun using drones to launch and coordinate attacks. Meanwhile, these groups learn from previous attacks. The most notable lesson they drew was instantiated in Daesh's use of drones during the military operations in Mosul. The rapid improvements in drone technology, added to its increasing capacities, and availability to terrorist groups have brought about multiple reasons for people to panic. Terrorists do not even have to use a biological or chemical weapon to launch an attack. A simple splash of water or of some other

household cleaning agent on a crowded area will be enough to cause panic. Critical infrastructure is also at risk, and fortification of thousands of sites against attacks would be financially restrictive at best. Potential infrastructure targets include fuel or water storage facilities, gas pipelines, power plants, and food supply sites, many of which are minimally or completely uninhabited. In 2013, a targeted attack on a power distribution facility in California nearly sent a major part of the state into darkness. The attack on this uninhabited facility caused damages estimated at US\$15 million. Because of the low production of damaged specialized parts, it took weeks to repair the damaged facility and restore operations to normal. Had the perpetrator attacked more than one facility, the explosions and damages would have been much weightier.

The ability of drones to launch multiple attacks simultaneously, at a relatively low cost and long confrontation distance, will lead to the employment of the drone as a primary tactic in future terrorist attacks. The cost of defeating the enemy's air defense systems is enormously expensive for drones unless they add or remove specific systems onboard or change their method. Terrorists have already begun experimenting with drones in their attacks, and it will not take more than one high-level attack for all terrorist groups to realize and exploit this technology.<sup>31</sup>



