

# THE MILITARY UTILITY OF DRONES

Drones have assumed a leading role in counterterrorism and counterinsurgency, and are projected to be of growing importance in future military operations. Their low cost makes them expendable and ideal for highly dangerous or politically sensitive missions. However, technical limitations as well as likely improvements in competing technologies, notably air defence systems, shall circumscribe the military role of drones. Although an integral part of future warfare, they are unlikely to fully replace manned aircraft and will instead, complement them.



*MQ-1 Predator drone armed with Hellfire missile*

*Source: US Air Force*

Drones have come to prominence in recent years due to their widespread use in counterinsurgency. Some analysts assert that they symbolise a transformation in warfare, similar in scale to the gunpowder revolution. Some even hypothesise that drones might one day replace manned aircraft in combat and logistics roles. However, these projections are likely to prove unrealistic, given the fundamental limitations of drones. Such limitations are not just technological, but also doctrinal.

Two key questions arise while assessing the military impact of drones. First, do they represent an evolution or a revolution in military technology? The former implies a gradual change in operating systems and practices, which can be countered through matching innovations. The latter implies that drones convey an asymmetric and possibly decisive advantage to the side that possesses them. A long-term historical perspective would suggest that drones are evolutionary, not revolutionary.

Second, how do the advantages of drones compare against those of manned aircraft? The argument that drones can replace manned flight is based partly on a normative assumption that drone technology represents a comprehensive improvement over current aviation systems. However, this assumption overlooks the possibility that such technology might have been developed in response to specific needs. In other words, drones might be engaged in tasks which are inherently less suited to manned aircraft, not because they represent a comprehensive improvement over manned aviation.

This brief suggests that while drone usage in warfare is steadily growing, their current importance flows largely from the particular requirements of post 9/11 counterterrorist missions. The brief shall examine the strengths and limitations of drones and also describe the political controversies that their use poses for decision-makers.

## Evolution, not revolution

The term “drone” refers to all unmanned powered aircraft which can be used repeatedly (unlike missiles). These are variously known in technical jargon as Unmanned Aerial Vehicles (UAVs), Remotely Piloted Vehicles (RPVs) or Remotely Operated Aircrafts (ROAs). There are three types of drones: strategic, operational, and tactical. Strategic drones are used for long-range reconnaissance over hostile territory. They include systems like the Global Hawk, which can cruise at 20,000 meters above sea level for 40 hours and travel 3,000 nautical miles. Operational drones include the Predator and Reaper systems, which can fly at 7,500 and 15,000 meters respectively. They are deployed at the theatre level of combat and can be used for both reconnaissance and attack purposes. Lastly, tactical drones are low altitude, short range aircraft (20 miles or less). An example is the Dragon Eye system. Unlike strategic and operational drones, which can be either remotely piloted or preprogrammed to fly autonomously, tactical drones are fully operator-controlled. They are commonly used by police forces in developed countries, for crowd control and border surveillance.

Except for the Predator/Reaper series, most other types of drone are used for intelligence gathering. Their role in warfare has historically been that of a force multiplier which enhances the effectiveness of combat units through sensitizing them to their operating environment. As independent weapon systems, drones have had little role.

This observation is illustrated by the trajectory that drone usage has taken over the last fifty years. During the Vietnam War, over a thousand drones mapped out

North Vietnamese and Chinese logistics networks. Despite many being shot down by Chinese air defence systems, Washington was able to avoid the diplomatic embarrassment that would have resulted had it used manned aircraft. Over the next two decades, Israel joined the United States in pioneering drone technology. Prior to attacking Syrian bases in Lebanon in 1982, Israel used drones to probe the Syrian radar system. The technical intelligence thus gathered helped Israel shoot down 86 Syrian fighter aircraft in air-to-air combat, with the loss of just one of its own.

The 1991 Gulf War saw drones producing more intelligence than could be acted upon. Although the number of unmanned aircraft deployed in-theatre was miniscule, they still identified more targets than the entire resources of the US 7<sup>th</sup> Corps could hit. Eight years later, drones played an even more crucial role in Kosovo, flying low to identify targets which could then be attacked by manned aircraft operating above 15,000 feet. Through this division of tasks, pilots remained outside the range of most surface-to-air missiles while drones, being easily replaceable, faced the risk of enemy fire.

It was during operations in Kosovo that drones began to assume an attack role, being fitted with laser designators to “paint” potential targets, which could then be destroyed by manned aircraft. This innovation prompted further research into the possibility of fitting lightweight missiles onto drones. US commanders who spearheaded the initiative wanted to create a system wherein the time lag between location and elimination of a target was minimised. Their efforts, which predated the 9/11 attacks, got a tremendous boost from the “War on Terror”. In November 2002, an Al Qaeda terrorist in Yemen was killed by a drone-launched missile – the first of many such strikes. With the introduction of attack drones into counterinsurgency operations in Iraq and Afghanistan, the time between detection and destruction of hostile forces shortened to just five minutes. During the 1991 Gulf War, the same process would take three days.

### **A growing role in counterinsurgency**

Drones assumed a leading role in counterterrorism/counterinsurgency for three reasons. First, their low noise meant that adversaries were less likely to detect their presence. Second, drones could loiter over an area longer than manned aircraft.

Lastly, they could fly low and expose themselves to enemy fire in order to verify the nature of their targets. Consequently, the prospects of collateral damage among the local noncombatant population were reduced (but not eliminated).

Upon being inducted into Afghanistan, drones became a favoured means of assassinating Taliban leaders. Fear of drone strikes led to the Taliban randomly executing members of local tribes on suspicion of being informers. This in turn, increased the flow of community intelligence to security forces, as the tribesmen sought revenge. Of late, US intelligence agencies have been able to build informer networks in regions that were previously closed to their personnel.

Drones have saved scores of American soldiers, by helping in the detection of buried roadside bombs and pursuit of the bombers. Unlike satellites, which followed fixed and predictable paths, they can be tasked on an opportunistic basis to follow targets as and when intelligence leads present themselves. This last quality is applicable beyond counterinsurgency; it is also relevant to surveillance of hostile state installations. The United States for instance, is widely believed to now be using drones to monitor the Iranian nuclear program. Finally, drones also obviate the need for combat search and rescue operations should an aircraft be shot down. Their use denies hostile regimes the propaganda advantage that would come with parading a captured pilot before television cameras.

### **Limitations of drones**

Notwithstanding the above factors, drones have yet to prove themselves as better than manned aircraft, on the basis of common standards of performance. For a start, drones are only effective in attack roles when operating against targets with no air defence capabilities. Unlike a fighter jet pilot, drone operators cannot detect threats to the safety of their aircraft. Surface-to-air missiles therefore pose a much greater threat to drones than to other forms of military aviation.

The vulnerability of drones to ground fire could become a debilitating factor, if greater dependence is placed on drones in war-fighting. One of the biggest advantages of unmanned aircraft is their low acquisition cost, relative to manned aircraft. However, heavy losses to enemy fire would drive the overall cost of drone operations beyond

sustainable levels. The United States had a similar experience when it attempted to use helicopters on a massive scale in Vietnam. Conversely, should efforts be made to enhance the operational sophistication of drones, per-unit costs will rise, making the loss of a drone a serious concern for military commanders. This would increase risk aversion.

In the final analysis, drones are popular because they present a low-cost option for locating and destroying low-tech adversaries. If they were to be upgraded to penetrate sophisticated air defence systems, their advantages vis-à-vis manned aircraft would fall away. Furthermore, drones have higher operating costs than manned aircraft, which in the long run, militates against greatly enhancing their use in warfare. They are also ten times more prone to crashing than fighter jets – a problem that can only be overcome through expensive technical upgrades.

Such considerations mean that drones have a niche role in contemporary military operations. They are by no means a transformative technology that has the potential to make manned flight obsolete. Expanded use of drones could even prove counterproductive, as it would threaten to lead to information overload. At present, Predator and Reaper drones in Afghanistan deliver around 400 hours of video footage daily to US forces. The transmission of this data to ground controllers based in the United States consumes vast amounts of communications bandwidth.

An illustration of the strain that drones pose to communications systems is provided by the fact that a single Global Hawk uses five times as much bandwidth as did all US forces involved in the 2001 invasion of Afghanistan. Although communications technology is presently being upgraded to cope with the demands posed by drone tasking and coordination, there are limits to which existing bandwidth can be expanded. This suggests that, even allowing for technological progress, there are limits to the potential use of drones in military operations. Furthermore, increased bandwidth also increases vulnerability to electronic counter-measures such as jamming.

Drones also have two undesirable side-effects. Firstly, they encourage senior commanders to micro-manage operations and insist that the latest imagery be provided to them before any action is taken. This

stifles tactical initiative and lengthens the time between identification and elimination of a target. Secondly, commanders at both operational and tactical levels can grow so dependent on drone support that they refuse to deploy their troops without it. Convoy movements in Iraq and Afghanistan are now partially conditional on the availability of drone cover – a sign of poor morale.

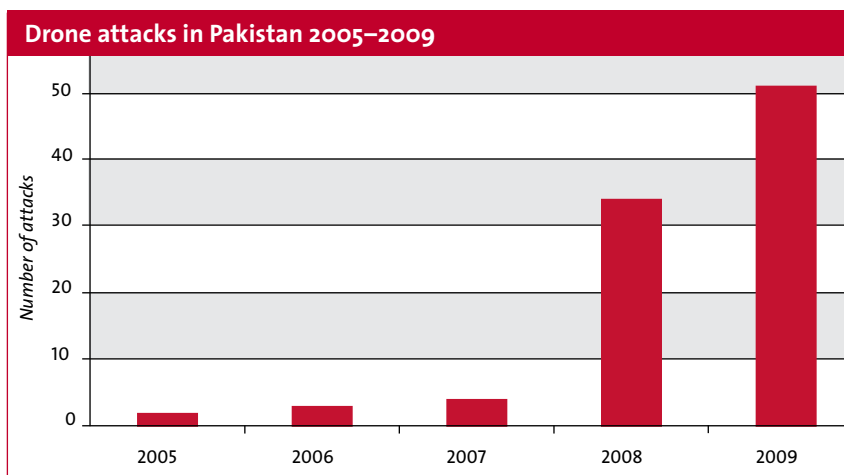
**Pakistan – political controversies**

Although drones have been a part of developed countries’ arsenals since the 1970s, their recent prominence stems from the Obama administration’s frequent use of them in Pakistan. Drones offer a cheap alternative to sending ground forces into Pakistani tribal areas. Such a move would cause heavy casualties among the local population, as well as destabilising the Pakistani state. Due to their low visibility, drones are considered less disruptive to local politics than any other coercive option.

Even so, controversy has erupted over drone strikes in Pakistan. Critics base their arguments on three points: first, that drones kill large numbers of innocent bystanders, second, that the rules of engagement governing their use should be made explicit, and third that they represent a violation of Pakistani sovereignty. To some extent, the first two points are interconnected, since drone operations are shrouded in secrecy, which fuels speculation about the nature of damage they cause.

Estimates of noncombatants killed in drone strikes vary from 10% to 98% of total fatalities. The range of difference stems from the fact that there is no reliable channel by which fatalities can be counted and categorised. The Taliban insist that the drones overwhelmingly kill innocents, while US officials deny this. Local surveys indicate that the strikes are less resented within the tribal population than might be expected, if the majority of the victims were indeed noncombatants.

However, unlike drone operations elsewhere, which are controlled by the US military, those in Pakistan are controlled by the Central Intelligence Agency. CIA officials are not subject to the same degree of oversight as military ones, raising doubts about the rigour of their targeting procedures. In the absence of radical changes to US secrecy laws, these doubts are likely to persist. This is particularly so owing to concerns over the legality of targeted killings outside warzones.



Source: Amnesty International

Finally, although drones are depicted as undermining Pakistani sovereignty, the fact remains that Islamabad is happy to countenance their use. 80% of drone strikes have been concentrated in the Waziristan region, which constitutes the home base of the Pakistani Taliban, a group opposed to Islamabad. Although publicly, Pakistani officials denounce these strikes, in private some officials criticise their American counterparts for not carrying out more strikes.

The real problem might therefore not be political, but doctrinal. Regardless of technological progress, drones are incapable of eliminating insurgent cadres in densely populated cities, where they are more difficult to locate among the general population. The fact that a drone-launched missile (even if precision guided) is an explosive device also reduces its utility while targeting a single individual in a crowded space. Extensive use of drones risks forcing Taliban insurgents to disperse into urban areas across Pakistan, where they will be much better placed to attack critical targets. Unless the United States and Pakistan can pre-empt this strategic shift, drone use might prove destabilising for Islamabad.

**Prospects**

At present, only the United States and Israel have demonstrated the capacity to manufacture attack drones. However, with more than 50 countries purchasing drones or building them indigenously, this is certain to change. More doubtful is whether drone technology will be able to remain inexpensive while becoming more sophisticated. The experience of manned military aviation, where acquisition costs have risen with technological improvements,

does not suggest that future drones will be cheap.

Furthermore, in contexts other than counterinsurgency and counterterrorism, the effectiveness of drones is largely dependent on the operating environment. If air defence technology improves at a faster pace than drone technology, dependence on unmanned aircraft could prove ruinously expensive for most countries. Despite this, the US military is currently investing heavily in operational drones. At the moment, most of its drones are tactical ones, which are cheap and easily replaceable.

Drones are likely to be most useful when carrying out vital missions deemed too dangerous for manned aircraft, such as electronic warfare over hostile territory. Even their use on border policing has proven controversial, with one study finding that the results produced do not justify the costs involved. From a long-term perspective, improvements in drone technology are occurring too slowly and incrementally to justify labeling it a transformative phenomenon. Rather than replacing manned aircraft in the future, drones are likely to only complement them.

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