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**Middle East's drone race, and implication of weaponizations on the
security landscape**



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Abstract.

With the advancements in technological wars, autonomous systems and their impact on the future security infrastructure have observed an increase in the defense debate. Lately, Unmanned Aerial Vehicles (UAVs) have fascinated experts, engineers, and scholars due to their application in security, lethal military operations, and emergency scenarios, where they can be deployed in hostile environments. In addition to having many military impacts, and relatively high consequences when it comes to warfare; drone use has both security and political dynamics. Nonetheless, the unpredictability of the technology trajectories can lead to significant negative consequences, especially the complexities involved in their application when it comes to unsecured regions with ongoing conflicts and crises, of which, the Middle East region is characterized. According to past studies, with the steady escalation in the number of users, be it for military or non-military use, the regional countries, including the UAE, are building their inventory of tactical UAVs for security and border patrol applications. According to recent media reports, under the 2008-2016 administration of Barack Obama, drone strikes proliferated as a way of fighting the counterinsurgency in Iraq and Afghanistan without risking military personnel on dangerous air missions. Furthermore, the Trump administration has taken it to the next level by employing UAVs to perform highly targeted assassinations. For example, the assassination of Soleimani, Leader of the Quads force in Revolutionary Guards in Iran. At the same time, drones have been found to be a tool used by violent groups such as The Islamic Group of Hamas and Hezbollah, which creatively developed a novel and scalable drone-based weapons system constructed from commercial components. The most recent example is Yemen's Houthis-backed drone attacks against Saudi Arabia's Jizan and Khamis Mushatt in March 2021. Indeed, the same exciting technologies that promise to enhance human capacity to fight threats and improve security will potentially be enormous future threats.

The capacity of militarized drones to perform stealth reconnaissance missions and launch precision attacks opens an all-new debate on the future security environment of the Middle East region; hence, this research aims to identify the security benefits as well as the risks of utilizing UAVs, the level at which they have penetrated, and how they have been creating controversies over the last decade in the region. The study will also utilize the qualitative research methodology in a cross-sectional approach to analyze and draw conclusions. The study will conduct an in-depth review of the literature using peer-reviewed journals, articles, websites, and textbooks of relative perspectives and studies to understand UAV technologies and their strategic importance in the security realm and discuss challenges presented by their proliferation beyond state control. With the steady growth in the application of militarized UAVs and increasing risk of commercial drones' expansion into lethal operations and its proliferation in the Gulf region; this paper will try to put into context both strategic benefits and threats to aid future researchers identify implications of UAVs in the targeted region for further study.

Keywords: Unmanned Aerial Vehicles (UAV), United Arab Emirates (UAE), Drones, security, and Warfare, etc.

1. Introduction

Artificial intelligence (AI) has been quite promising, deterministic, and capable of providing practical solutions to transform several sectors and industries globally, and has clearly made autonomous technology possible and its impact has been clearly felt in the military and security sector. It has remarkably changed the security dynamics in the Middle East, where the AI-powered, remotely operated UAVs have been used by foreign powers like the US to fight the Islamic States and by regional powerhouses to serve their geopolitical ambitions. However, there is a lot of instability raised by proliferation and diffused artificial intelligence inside these drones, causing differences among various strategic powers. The technology has played a significant role by aiding military actions for both lethal attacks and counter defense measures.

In simple terms, a UAV can be defined as a device that can be guided remotely or operated automatically to a target position by its owner, works with electronic transmitters and remote controllers (Burton, 2019). As far as the physical conditions of these aerial vehicles are concerned, they can be as big as the smallest helicopters, or they can be small that can be held in the hands (Johnson, 2019). Historically, the De Havilland DH.82B Queen Bee aircraft flown using a low-cost radio-control developed for aerial target practice is considered by many to be the first modern drone, and the first use in war fighting was 1946 (Custers, 2016) where balloon carriers were launched by the Austrian navy on Venice (Hallion, 2003). The technology was developed further during and after World War I and World War II, and over the 1900s. Today, they are sophisticated aerial vehicles with cameras and sensors providing real-time intelligence, surveillance, and reconnaissance (ISR) capabilities to multi-location receivers and have in flight sensors and controls to perform maneuvers around obstacles. In recent times, the use of UAVs for targeted military and terrorist attacks has risen. For example, the assassination of Briton Riyadh Khan by the Royal Air Force and the Assassination of Soleimani, Leader of the Quads force in Iran's revolution guards, etc.



Figure 1: Global Hawk. Source: (Guilmartins, 2020)

Recent research has found that combat drones are strategic in enabling state actors to be more vigilant towards terrorism and security. The global market for drone procurement is anticipated to reach US\$21 billion by 2025, and the Gulf region is no exception. The United Arab Emirates, particularly, had been found encouraging towards building their technologies connected to the development of UAVs and improving regulations to deal with such devices on the border regions. China was found to be one of the greatest dealers in this technology in the international markets by massively producing and supplying both armed drones and surveillance drones for security watch purposes (Okpaleke, 2021). The UAE's drone stock include Wing Loong" series and "Cai-Hong (CH) 4B" recognized under the Chengdu Aircraft industrial group and (CASC) (Borsari, 2021) and the country also plans to buy 18 sophisticated armed MQ-9B aerial drones from the US to be delivered by 2029.

Studies note that the vital function for the drones coming into the gulf region is for intelligence, surveillance, and reconnaissance (ISR), which promise to improve situational awareness on the battlefield, these war gadgets are scalable to meet various military applications. Many regional governments utilize the technology in their counter-terrorism campaigns and against domestic threats. Saudi Arabia and UAE had been deploying UAVs in their war against Houthis in Yemen. In addition to Chinese and US systems, Abu Dhabi and Riyadh are strengthening their domestic UAV industries and have invested in indigenous models such as the Emirate Yabhon series, produced by ADCOM Systems, and the Saudi Saker family (Borsari, 2021). Israel, by far, is the dominant country in terms of drone technology innovation and exports up to 60% of global UAVs. Meanwhile, Turkey has been a big supplier of drones to Qatar, Tunisia, and Libya's internationally recognized Government of National Accord (GNA).

But in the Middle East, the proliferation of armed drones and missile capabilities, also by non-state actors, has quickly become a top issue on the agenda. The drone warfare that took off in 2002 turned out to be a Pandora's box, as we see, now many types and sizes of drones are being deployed in various missions (Reinl, 2019). Drones are rapidly becoming powerful tools in the Geo-political dynamics with countries like Iran developing indigenous strike-capable platforms for combat and direct attack purposes such as the Ababil-3T, and its most combat tested UAV - Shaed-129. Non-state actors' use of weaponized UAVs is a recent phenomenon that has mainly taken place since August 2016 and almost exclusively only occurs in the Middle East (Benkendorfer, 2021). The most recent attacks represent a considerable upgrade in the sophistication of the drones used by radical groups. UAVs offer non-state groups a tactical advantage, and can dramatically improve their capabilities on the battlefield. The major challenges arising from these developments will deepen the intra-Arab divide and make the legal oversight of these drones difficult. Today, the UAVs have induced a transformation in the regional security realm by making it more asymmetrical.

2. Develop

2.1 Research Gap

This research study is going to explore and analyze the strategic and operational value of using these unmanned armed vehicles in the middle eastern countries in serving various purposes including security, lethal targeted assassinations, intelligence gathering, target finding, and lastly, in investigative procedures. The biggest reason why this advanced technology is accepted worldwide is the efficiency it comes with its cost, reliability over artificial intelligence, or the risk mitigation towards security risks, which have been preferred globally (Borsari, 2021).

UAVs greatly changed the security environment in the 21st century, especially since the technology has reached the hands of non-state actors. A key aspect of this research paper will focus on the implications of drone technology in the regional security environment and evolving challenges and possible solutions to the strategic threat to stability and peace in the region.

2.2 Research Aim and Objectives

This research study aims to understand and investigate the security implications of UAV application in the Middle East, focusing on the UAE. The study aims to achieve the same through the following objectives:

- Identifying the security advantages and disadvantages of using Unmanned Aerial Vehicles (UAV), in the Middle East, specifically in the UAE region.
- Identifying the possible challenges, risks, and hazards, which can occur during the use of Unmanned Aerial Vehicles (UAV).
- To analyze the implications of using these automated armed aerial vehicles for political and security reasons and the impact of use by non-state actors.
- To analyze two case studies where the UAVs application were used for strategic advantage by state actors and by non-state violent groups.

2.3 Research Questions

- i. What are the consequences and evolving challenges of using Unmanned Aerial Vehicles (UAV) for military and security-related activities?
- ii. What kind of advantages can be accomplished using Unmanned Aerial Vehicles (UAV) in security applications?
- iii. What are the impacts of using Unmanned Aerial Vehicles (UAV), on the political and security dynamics of the region?

2.4 Research Methodology

The research will be carried out on a desk-based methodology. It will make use of secondary data (qualitative data) to investigate and analyze the application and implications of UAVs in the Middle East region. The research strategy will adopt a cross-sectional approach, due to the factors of time constraint and availability of data basically from secondary means. Levin (2006) explains that studies adopting a cross-sectional approach are carried out within a specific period. The reason behind selecting this method is the sensitivity of the topic, and the availability of a vast database of related studies which will be enough to research implications and strategies, and how they are being utilized around the Middle East. The research will have the following flow features:

1. Collecting data and information on the applications and security implications of UAVs from various textbooks, journals, related research studies, online sources, organization websites, military & paramilitary websites, and government agencies.
2. Investigating, analyzing, and scrutinizing (critical observation) collected data and information from various textbooks, journals, related research studies, online sources, organization websites, military & paramilitary websites, and government agencies.
3. Researching and analyzing the concepts, functions, challenges, risks related to applications of drones from various textbooks, journals, related research studies, online sources, organization websites, military & paramilitary websites, and government agencies.
4. Relaying findings and making citations to references gotten from all the sources used by this study.
5. Concluding and making recommendations about the research study.

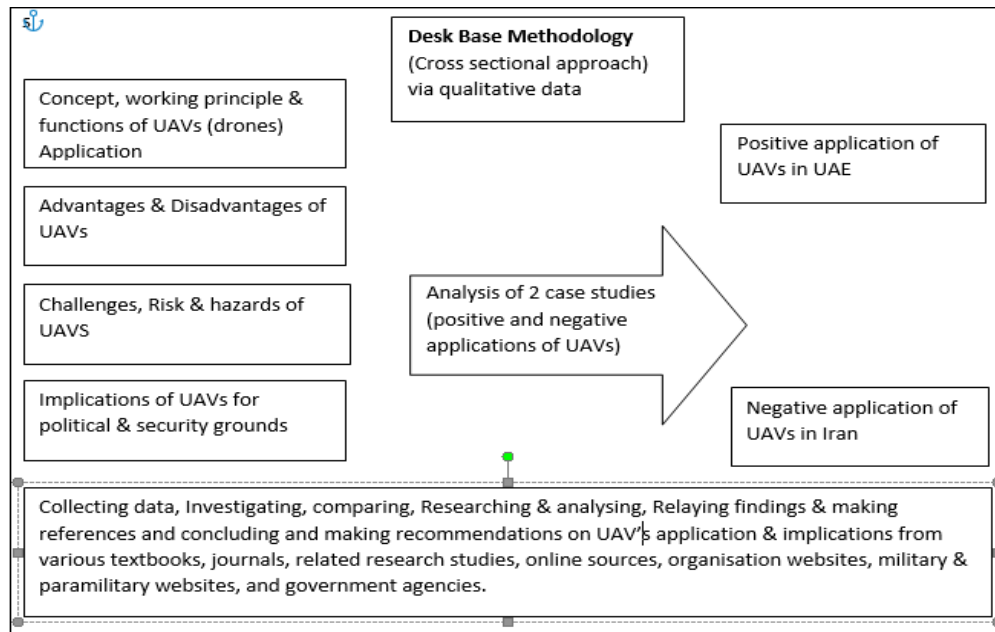


Figure 2: Methodology workflow. Source: (Initiated by this research)

2.5 Research Study Area

The research will focus on the Middle East region. The Middle East region refers to countries around the Arabian Gulf region; it spans majorly from Western Asia toward Northern Africa to Egypt and Sudan. The region has over 18 countries, of which the majority belong to the Arabian nations league and are Muslims by religion. Among nations in the Middle East are Saudi Arabia, UAE, Iraq, Iran, Egypt, Turkey, Yemen, Kuwait, Oman, Afghanistan, etc. The region, which is relatively characterized by the high level of conflicts, wars, political instabilities, ranging from the Israeli- Arab conflict, Taliban-US wars, ISIS terrorism, Syria war, several assassination attempts, various suicide bombings, etc. Hence, the alert (security awareness) and the security risk around the region cannot be overemphasized. The study will analyze two case studies, focusing on the application of drones in the operation, revealing where the technology (UAV device) has impacted positively and where it has impacted negatively in the Middle East and used by state and non-state actors.



Figure 3: Map of the Middle East Source; (World Atlas,2021)

2.6 Literature Review and Theoretical framework:

During the evolution phase of any technology, there are multiple elements to study to understand its value and impact on the world. Drones have continued to see advancements in form and capabilities as well as their scope of use over the last century. But the rapid proliferation lately has raised a lot of debate among academics, government, security experts, and legislatures. This paper has drawn five elements that have influenced the development and proliferation of drone technologies in the Middle East: a technical element which is related to how improvements have been made to the working capabilities of UAV; the business element which shows how much has been spent or made from selling and buying of UAV; the strategic element that analyses how the technology is leveraged by countries; the legal element which relates to the judicial implications; and finally, the social element referring to the public safety and perception.

Practically, with the widespread instability and ongoing rift between countries in the Middle East, there have been reports of numerous UAV attacks in defense, assassinations, aerial bombing operations, and other minor conflicts, etc., and in (military operations) carried out by the government forces, anti-government groups, insurgents, terrorists.

2.7 Drones Technology Advancements

The combination of how the UAV is being used for several military purposes has undergone improvement in the existing hardware and software, hence earning the term ‘capability maturity model’ of a technology (Rouse, 2007). They have been widely accepted in the military world over the last two decades, and the success of their applications or operations is growing. Meanwhile, the establishment of

unmanned aircraft in non-military roles has also begun to emerge massively. According to data from Globe Newswire, the global military drone market size is projected to reach \$23.78 billion by 2027. Military spending also tends to come in larger increments, as a single US Predator drone costs approximately \$4 million. UAVs appear in different types, aerodynamic models, shapes, and sizes, depending on their functionality, job description, location/ environment, and target type. In the modern world, UAVs make a lot of sense, especially on the battlefield. They are highly convenient since you don't have to worry about deploying people behind enemy lines, and evolving technologies include AI to recognize and respond to threats autonomously, saving battery power using perching and resting technology, airborne communication, and satellite linking (Sarkar, 2021).



Figure 4: Types of military UAVs ; (Mydronelab, 2012)

Some experts and engineers have categorized UAVs/drones based on the constraints of size, range, and configuration. Figure 3 shows an overview of different kinds of UAVs categorized based on size, endurance, and configuration in a tabular form (Mairaj et al, 2019) (Snow, 2018) (Abdullah, 2018).

In most instances, the application and type of operation are mostly dependent on the size, larger drones are seen to be used in military and combat operations while the smaller drones are used for security surveillance, agriculture activities, academic research, wildlife monitoring, and entertainment activities. Similarly, in terms of endurance, the UAVs with greater endurance find their applications in surveillance missions, whereas the smaller UAVs work well for traffic monitoring, and entertainment (Mairaj et al, 2019).

As far as applications are concerned, UAVs have performed many tasks in recent times in various sectors, it has been found to develop economy, create opportunities, assist in different kinds of surveillance, investigations, delivery services, traffic management activities, accessing of dangerous hazardous environments, hitting of targets in inaccessible areas, visual capture of inaccessible area and timing constraint, locating of survivors and tracking of crime/criminals, etc.

2.8 Drone penetration in the region

This decade has seen constant extensive embracing and distribution of unmanned aerial vehicles for use in recreational, commercial, civil, education, law enforcement, and national security applications, with an expected generated revenue/ income of about 12 billion dollars globally by the year 2021. Today, drone machinery is no longer constrained to its application in the military, entertainment, security surveillance, and meteorology. The massive availability of UAV toys has made it easy to be purchased for as little as hundreds of dollars nowadays for any intended purpose. Thus, the commercial drone market was projected to maintain overgrowing over the next few years while giving opportunities to several industry co-operators, attaining a global income/ revenue of \$13.7 billion by 2025 (Nguyen and Nguyen, 2021).

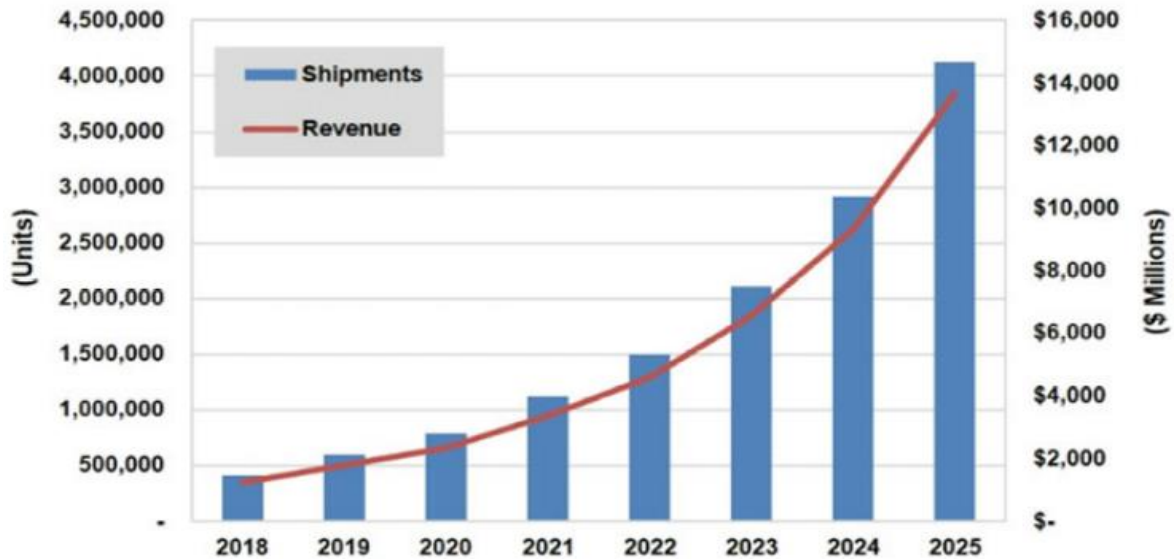


Figure 5: Commercial drone Hardware shipment, and total revenue (hardware + services), world market 2018-2025.
Source: (Nguyen and Nguyen, 2021)

In the Middle East, Saudi Arabia operates one of the largest and most modern and has purchased a few armed drones, particularly from China. The UAE also has been developing drone capabilities, particularly with the Wing Loong series produced by the Chengdu Aircraft Industry Group. However, both countries have begun manufacturing their UAVs. So far, the acquisition of armed UAV capabilities has not altered how the country perceives the tools of airpower, nor the sort of strike operations it conducts. This move has also been embraced by other middle nations like Iran, Yemen, Iraq, UAE, Syria, Qatar, Kuwait, etc. Due to ongoing conflicts, and violent actors adopting the technology in the Middle East, the strategic importance of UAV platforms has expanded in the defense apparatus of numerous states. This tendency is particularly observable in the Middle East, where military UAVs accounted for about 82% of the overall regional drones market in 2019. Available data indicate that since the introduction of military UAVs in the MENA market space, regional countries (excluding Israel) have plausibly spent at least \$1.5 billion in purchasing these platforms (Borsari, 2021).

The UAVs have been used to carry lethal target attacks on rival nations' armies, terrorists, infrastructures, oil and gas facilities, and more often for assassination purposes by releasing or controlling them to target locations (CBSNews, 2021). They are also used to deliver military apparatus (guns, bullets, magazines, explosives, arsenals, PPE, and food & medical relief materials) to soldiers in inaccessible areas like bushes, mountains, desert areas during operations.

For example, Saudi Arabia has been heavily involved in campaigns against ISIS in Iraq as part of the US-led coalition for more than four years, as well as its fight against Iranian-backed rebel Houthi fighters in Yemen, prompting the Saudi military to acquire more drones recently, increasing its drone defense forces at the Sharora and Jizan air bases near the Yemen border. Thus, in the Middle East, the procurement of UAVs (armed drones) seems to have increased with countries having the drive of prestige, lethal military attacks, a domestic defense industry, as part of an ambitious wider national development plan (Dorners, 2021). Recently, armed UAVs have begun to change the way airpower campaigns are viewed in the Middle East and their massive acquisitions have been caused by an improvement in military operations' requirement due to conceptual future military and defense/ security operations, especially Iran which openly show their massive purchase, production, and use of UAVs recently. Examples of the armed UAVs predominantly in the Middle East are Global Hawk, Wing Loong, CH-4B, Predator A, Harfang, RQ-7 shadow, Fire Scout, etc. (Fahlstrom, & Gleason, 2012).

| | |
|---|--|
| Drone Wing Loong II | Range >1000km with SatCom, ~150km from Ground Control Station (GCS) if not |
| Type Medium Altitude, Long Endurance (MALE) UAV | Sensor Options Infra-Red (IR) and Electro-Optical (EO) cameras, and laser designator in sensor ball |
| Manufacturer Chengdu Aircraft Industry Group (CAIG) | Weaponry Up to 480kg of payload on twelve wing hardpoints which can include: AKD-10 air-to-surface anti-tank missile; BRMI-90 90-mm guided rocket; FT-7/130 130-kg glide bombs; FT-9/50 50-kg bomb; FT-10/25 25-kg bomb; GB-7/50 50-kg PGM; and GB-4/100 PGM |
| Number 5 | |
| Endurance Up to 32 hours depending on payload | |
| Loaded Weight 4200kg | |
| Payload Capacity 480kg | |

Figure 6: Description of Wing Loong UAV. Source: (drone.rusi.org 2021)

2.9 Advantages and disadvantages of UAVs

Most of the advantages of drones are drawn from their initial intended functions ranging from package delivery, surveillance, tracking of crimes and criminals, investigation activities, search activities, rescue operations, etc. The foremost advantage and reason for utilizing drones in the conflict region was its ability to access targets in dangerous areas without the risk of loss of lives during operations. Ann Rogers notes that drones offer three clear benefits over manned systems: Access, persistence, and accuracy. She notes in her analysis that drones have become an increasingly attractive option for policy-makers and

military commanders alike, while also concluding that drones cause significant loss of civilian life amid much controversy (Rogers, 2014). They present invaluable real-time intelligence akin to watching high-definition television and sensors that collect a wide range of signals intelligence. They also offer persistence of the target area and multirole flexibility to strike if the rules of engagement allow. These traits created an evolution in warfare in a permissive environment, allowing tracking of high-value targets and finishing with a precision strike upon meeting defined criteria (J Nemeth, 2017). However, there are a few noted disadvantages and vulnerabilities, such as the inability to operate in a contested environment, potential susceptibility to cyber and electronic warfare attacks, and manpower and frequency spectrum intensity to name a few.

Being a cheap tool that can be easily modified as a weapon has perhaps made UAVs be used by criminals and terrorist groups. In fact, the biggest disadvantage in security applications remains their widespread availability and easy scalability. And recent years have seen the use of drones by terrorist organizations. The first successful and significant use of drones to attack rival forces by a non-state actor was carried out by Hezbollah agents in Syria in late September 2014 (Mohammad, 2017). This has opened a new race for counter-drone technologies globally.

2.10 Challenges related to weaponizations

Over the past few decades, UAV technology has been remarkable. But so, too, has its accompanying controversy, with two major challenges being proliferation and weaponizations by non-state actors like terrorists and radical groups.

Non-State Actors: It is believed that drones used by Hezbollah, Hamas and Houthi are provided by the Iranian regime. Unlike these terrorist organizations, ISIS developed its drone program using off-the-shelf commercial drones and the group increasingly used drone-based operations, including surveillance, command and control, and attacks. These published pictures and videos were largely employed for propaganda purposes (Al Mohammad, 2017).

However, the Houthi insurgency against the Government of Yemen and the Saudi-led coalition is unique, in that weaponized UAVs give the insurgency an aerial advantage to strike from extremely long ranges. According to Metz, modern insurgencies play a strategic role and are important because of the links to transnational terrorism and the ability to project long-range attacks using terrorist methods against countries who assist the government they are fighting (Benkendorfer, 2021). The critical role drones played in the war on terror for the US after 9/11 has transitioned to more complex dynamics. Since the attacks of September 11, 2001, and the onset of the war on terror, weaponized drones have effectuated thousands of strikes in numerous countries spanning multiple continents during acclaimed non-international armed conflict with “Al-Qaeda, the Taliban, and their associated forces” (Swan, 2019). In an age of expanding weaponized drone proliferation in the region, where both state and non-state actors have been weaponizing the system, the legal and regulatory framework of such technology remains premature, raising rule of law concerns, potentially setting a troubling precedent for other state and non-state actors.

Public safety: Despite their foremost advantage in saving lives of boots on the ground (soldiers) in dangerous missions and targeted strikes, UAVs have also raised questions around their capabilities to infer the right target. A Bureau of Investigative Journalism report says that from 2009 through 2015 at

least 372 drone strikes were carried out in Pakistan/Afghanistan resulting in at least 2,084 total casualties, of which at least 246 were civilians.

Cyber Threat: Even though drones present many gains, they also encounter many cyber threats and cyberattacks such as global position system jamming and spoofing, Wi-Fi security issues, sensor security concerns, Bluetooth security, UAV network security, and malicious attacks. UAVs incorporate high-accuracy cameras, sensors, and recorders that store images, signals, and voice notes respectively, both remotely and precisely and if hacked can lead to leakage of data and information important for national security.

2.11 UAVs: Strategic Aspect

As a result of the increased deployment of drones in the Middle East and Gulf area, there have been an increase in security difficulties, wars, conflicts, and terrorism. The Middle East is still a dangerously militarized region, with major wars and active combat zones dominating the region's political landscape. As a result, studying Middle Eastern foreign affairs has been dubbed the study of interstate warfare. So, most Middle Eastern literature has concentrated on the chronology of Arab-Israeli conflicts, the Israeli invasion of Lebanon in 1982 and Gulf War I, notably among battles of preceding era: civil war in northern Yemen and Lebanese Civil War, Iraq revolution and Gulf War, Iran-Iraq war. These conflicts have served as barometers for gauging the region's history and importance (Sasli and Jacobi, 2002). Middle Eastern nations, such as Saudi Arabia and the United Arab Emirates, are using drones to tighten their control over mountain borders to deter infiltration, particularly by al-Qaeda in the Arabian Peninsula, violent groups. The Experts say that Gulf countries' air force procurement are changing, responding to the region's dual goals of energy security and economic diversification. Gulf nations are increasingly looking to construct their national military technical and industrial bases, and these recent advances in the procurement of the Gulf Air Force will undoubtedly have substantial influence on the global arms trade and accompanying power dynamics. Saudi Arabia's Saudi Military Industries Company is an important part of the Kingdom's Vision 2030, while the UAE has announced the development of EDGE, the region's first military conglomerate. Qatar looks to be contemplating similar means of economic diversification, maybe with the assistance of Turkey. Security has also been improved for Gulf Arab states because of diversifying their defense industry. By not depending on just one partner, they've been able to gain the backing of many other nations, which has given them relative independence.

This year's drone attacks targeting Saudi Arabia have again brought in political and security perceptions for the region and opened discussion on its expansive impact on the global security sphere, the proliferation and the use of missiles and drones undermine the security and stability of the region.

With further advancements in UAV technology, their strategic role in the regional security and political role. According to reports, their strike and reconnaissance operations will also undergo some changes in the future, as well as their strategic application. If there's one lesson to be learned from Turkey's UAV activity in Syria, it's that costly UAVs/drones like the Anka or Orion shouldn't be used for close support because they're expensive, don't carry enough weapons, and are easy targets. Instead, we believe it would be more prudent to arm the large, heavy drones and have them fly at higher, safer altitudes, while smaller drones fly at lower altitudes searching for targets and attracting ground fire for the higher-flying drones to detect and then aim in the future (Sarkar, 2021).

2.11.1 Case Study 1: State Action using UAV

For the past two decades, the Middle East and countries including the UAE, Saudi Arabia, Israel, and Turkey have been accumulating their military technologies, including UAVs from China and the US. Their primary advantage is the capability to be controlled remotely without risking and endangering the lives of a country's forces and military apparatus (Kondoch, 2020). Turkey is slowly catching up to the United States and Israel as the world's leading sellers of surveillance drones by producing and exporting its own indigenous systems. The UAVs are considered a vital tool for military actions; however, they have transpired to be a powerful tool for political means in the Middle East.

The most impactful leveraging of UAV technology by a state actor was seen in how Turkey's mid-altitude drones Bayraktar TB2 and Anka played a central role in shifting Libya's civil war in favor of the Turkish-backed government based in the capital, Tripoli. A signal moment for the drone program occurred when 36 Turkish soldiers were killed in a Syrian airstrike (said by Turkey) in Syria's northern Idlib province, a rebel stronghold where Turkey had deployed troops. It was the highest death toll Turkey's armed forces had suffered in decades. Hundreds of Syrian soldiers were "neutralized" following this by coordinated drone attacks using TB2, a strategic-class drone with high payload capacity, air-to-air and air-to-ground attack capabilities, mission interoperability with fighter jets and fully autonomous flight and take-off control systems, which provides the Turkish armed forces high-level ISTAR and strike capabilities that only Israel (and the US) currently possess. Aerial of these attacks' footage posted by the ministry showed a series of targets as they were destroyed by explosions. But the crucial role these TB2 drones played in the six-week conflict between Azerbaijan and Armenia over the disputed territory of Nagorno-Karabakh brought new prominence to Turkey's drone program. Experts believe that Turkey's drone attack demonstrated a sophisticated capability to coordinate the growing drone fleet with other weapons, which was a conceptual breakthrough in terms of the strategic advantage UAVs present on the battlefield.

UAVs have become useful tools for politicians by providing tangible results without any meaningful human engagement. The definition of war and politics was never so close as it is now to the Clausewitzian concept that "the war is the continuation of politics by other means." It is one of the greatest advantages of the future of war that limits human losses by allowing a machine to perform missions that would traditionally have involved troops or human pilots. This advantage will provide the impetus for the coming revolution in remote warfare. The strategic tactical and political efficiency of the apparatus has been demonstrated in three conflicts Turkey is currently involved in, the civil wars in Libya and Syria and, most prominently, the recent outbreak of war in Nagorno-Karabakh. For the regional states, UAVs are an essential tool to keep watch in the sky for any military or security threats.



Figure 7: Turkish drone Bayraktar TB2 Source: (Daily Sabah, 2021)

2.11.2 Case Study 2: Drone Insurgency by Non-state Actors

In January 2019 armed drones owned by Houthis killed several Yemeni government officials. This was one of the initial cases where violent non-state groups successfully deployed a drone to carry out a precision-targeted operation. The Houthis are an Iran-aligned armed rebel movement that has been fighting to overthrow the Yemeni government. The attack killed at least 6 members of the Saudi-backed Yemeni forces and the drone in question was an Iranian Ababil-T from the Ababil II family of drones, which are strike-capable platforms for combat and direct attack purposes. In September of the same year, the Houthis, with alleged support from Iran, were suspected in the attack on the world's largest oil-processing facility in Saudi Arabia. While their precise tactical capabilities are unclear, the rebel group claims to possess several short-range ballistic missiles (SRBMs) with ranges from 30 km (18 miles) to 1,000 km (620 miles). The group, with help from Iran, also claims to possess several indigenously produced drones with ranges from 15 km (9 miles) to 500 km (310 miles). According to the UN, the new long-range UAV - Samad can fly up to 1,200-1,500 km (745 to 932 miles) - putting Riyadh, Abu Dhabi, and Dubai within range.

The Islamic State made ground-breaking use of commercial drones in waging an aerial bombardment campaign against U.S.-led forces in their defense of Mosul in 2016 and 2017. They were also able to modify them to create a novel weapons system that was identified by many experts as the “most daunting threat”. In the following year, IS conducted between 60 and 100 aerial drone bombing attacks a month. Most recently, in August, weaponized drones were used to attack Jizan Airport in Saudi Arabia. This resulted in both regional and international countries voicing support for Saudi Arabia, which retaliated with airstrikes against the militia group. Other non-state actors, such as Hezbollah, have also developed UAV capabilities. Besides ISR and strike purposes, the IS and Hezbollah have also used drones for propaganda, indicating expansion of their drone capabilities in the future that could deeply impact the regional security landscape.

These recent developments have also resulted in civil-society groups, such as Human Rights Watch, and disarmament advocates calling for multilateral action to create stronger international norms on the development and use of UAV technologies. Supporting such action, more research is needed on how nonstate groups adopt technologies and how particular contexts encourage the development and use of these weapon systems.

3. Conclusion and Recommendation

The globe is now arriving in an era with Unmanned Aerial Vehicles/drones as technology in the race for creating a criterion for global competition, and it is massively influencing the ways of how military offense and defense mechanisms are being carried out during conflicts and rivalries. The middle east has been characterized heavily by a lot of its crises, conflicts, wars, and terrorism in recent times and before, most nations carry out their military offense and defense with the application of lethal UAV, hence the reason for the drastic demand of these devices around the geography of the study area. Nonetheless, the propagation of lethal drones has been escorted by its rapid adaptation to new, and perhaps surprisingly, civilian commercial drones, which have altered the market dynamics of the device in terms of production, demand, and supply. The world is seeing an increase in demand for UAVs for commercial/ business applications and its development of new types and forms to meet demands in various sectors and industries, especially the military sector. This has given rise to the massive investment being inputted into the drone business. The Middle East nations are now following the pathway of China and Russia in outlying billions of investments to meet up with the United States' investment in research, production, and development for UAV/drone technology. The growing use of UAVs by non-state actors poses a global threat as these UAV technologies are scalable, and there is a need for multilateral dialogue and action to contain drone use within the hand of state actors and unified action for counter-UAV technologies. The heightened complexities in the regional power dynamics have also motivated major states to improve security self-reliance. The regional states will likely keep investing massively in the military complexes of the international powers that collectively ensure their security, which also means the pervasiveness of UAV use by criminal and violent radical groups. Therefore, the study will recommend more international and national policies to regulate the production, sale/purchase, and use of UAVs as a lethal weapon via regulations, fines, penalties, and sanctions, to control how UAVs are used. And multilateral dialogue and action by regional and international security players in fighting the drone menace. This will assist against the uncontrollable use of technology for ill-gains and crimes against humanity.

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