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Armed and Unarmed Unmanned Aerial Vehicles and Their Role in War (44-Day Karabakh War)

Silahlı ve Silahsız İnsansız Hava Araçları ve Onların Savaştaki Rolü (44 Gün Karabağ Savaşı)

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Abstract

Despite the long history of unmanned aerial vehicles (UAVs), thorough investigations into the operational capabilities of these technologies have increased significantly in recent years. In today's volatile political and military environment, UAVs are used in a variety of missions, including reconnaissance, surveillance, search and rescue, and direct attack making them an indispensable part of contemporary security strategies. Technological advances have made UAV systems more accessible and effective, attracting not only major powers but also medium and small-scale states to these technologies. In this context, the production, procurement, and use of combat UAVs have paved the way for a new strategic dimension in international relations.This study analyses the development of UAV technologies through the examples of Türkiye and Israel in the context of Karabakh War that broke out on September 27, 2020. While Israel stands out with its leadership in this field, Türkiye has become an effective actor, especially in recent years with systems such as Bayraktar TB2. Azerbaijan, one of the most concentrated and effective examples of the use of these systems, which both countries produce, has revealed the decisive role of UAVs during the war. In addition, the study evaluates not only the tactical but also the strategic dimensions of these technologies, revealing how UAVs have transformed the nature of warfare and affected the regional security architecture in the axis of Azerbaijan.

Keywords: Armed UAVs, Unarmed UAVs, Karabakh War, Military Technology.

Paper Type: Research

Öz

İnsansız hava araçlarının (İHA) uzun geçmişi olmasına rağmen, bu teknolojilerin operasyonel yeteneklerine yönelik kapsamlı araştırmalar son yıllarda önemli ölçüde artmıştır. Günümüzün değişken siyasi ve askeri ortamında, İHA'lar keşif, gözetleme, arama kurtarma ve doğrudan saldırı gibi çeşitli görevlerde kullanılması onları çağdaş güvenlik stratejilerinin vazgeçilmez bir parçası haline getirmiştir. Teknolojik gelişmeler, insansız hava aracı (İHA) sistemlerini daha erişilebilir ve etkili kılmış; bu durum yalnızca büyük güçleri değil, aynı zamanda orta ve küçük ölçekli devletleri de bu teknolojilere yöneltmiştir. Bu çerçevede, savaş İHA'larının üretimi, tedariki ve kullanımında yaşanan artış, uluslararası ilişkilerde yeni bir stratejik boyutun şekillenmesine zemin hazırlamıştır. Bu çalışma, 27 Eylül 2020'de başlayan ve 44 gün süren Karabağ Savaşı bağlamında, Türkiye ve İsrail üzerinden insansız hava aracı (İHA) teknolojilerinin gelişimini analiz etmektedir. İsrail bu alandaki öncü konumuyla öne çıkarken; Türkiye, özellikle son yıllarda Bayraktar TB2 gibi sistemlerle etkin bir güç haline gelmiştir. Her iki ülkenin geliştirdiği İHA sistemlerinin en yoğun ve etkili biçimde kullanıldığı başlıca uygulama alanlarından biri olan Azerbaycan, söz konusu savaş sürecinde bu teknolojilerin belirleyici rolünü açık bir şekilde ortaya koymuştur. Çalışma, İHA teknolojilerinin yalnızca taktik değil, aynı zamanda stratejik boyutlarını da ele alarak; Azerbaycan bağlamında, bu araçların savaşın doğasını nasıl değiştirdiğini ve bölgesel güvenlik mimarisi üzerindeki etkisini ortaya koymayı amaçlamaktadır.

Anahtar Kelimeler: İHA, SİHA, Karabağ Savaşı, Askeri Teknoloji.

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Makale Türü: Araştırma

Introduction

In the contemporary period, UAVs made significant contributions to the combat ability of operational forces, and especially monitored UAVs have skills that reshape operational concepts and strategic decision-making in conflicts. In this context, states with UAVs/UCAVs can use drones without endangering the pilot's life and alter the outcome of the war in their favour with the minimum loss of life. This leads to a wider range of potential uses for drones. Therefore, UAVs/UCAVs are frequently used by modern nation-states as a means of transforming the result of a war to prove the state's regional power and at the same time to turn the war to its advantage. In that sense, especially after the 44-day Karabakh War, which had a multiplier effect in the South Caucasus region, UAVs/ UCAVs became more popular and in demand in the security efforts.

The hypothesis of this study, which examines the role of drones in wars and their strategic consequences in the context of Bayraktar TB2 and Harop UAVs/UCAVs, two different faces of the Karabakh War, is as follows. The use of drone technology not only creates an impact beyond national borders but also plays a game changer in restoring the self-confidence of states and creates a strategic means of solving war in a less costly way. In this framework, case study analysis was utilized methodologically in the article. This methodology, which involves the elaboration of data through the research problematic, and the units of analysis determined around it, examines the 44-day Karabakh War cross-sectionally, while longitudinally, the UAV technology that Türkiye and Israel tried to advance in various time periods is discussed. At the meantime, information on the ascendance of Israel and Türkiye as a UAV/UAV force was obtained from government documents, media publications, speeches and interviews of representatives of the government.

The new theory of war and technological determinism guide the theoretical framework of this study. According to this theory which outlined by Mary Kaldor, a wide variety of war units, including public and private, state and non-state, and a mixture of both, mainly constitute the conflicts experienced today (2007, p.97). Unlike traditional wars, modern wars take on a hybrid character, with the emergence of technology and irregular tactics. In this theory of war, securing control of territory through political means takes priority over seizing territory from enemy forces (Kaldor, 2007, p.104). In addition, technological determinism, which forms the general framework of Winner's work on technological developments, is also viewed as a means of shaping political and social order (1986, pp.19-39). Based on the notion that technological advances not only have instrumental effects but also exert decisive influence on social, political, and cultural structures, thereby shaping the political decision-making process. This approach argues that the integration of UAVs into the battlefield has transformed both operational efficiency and the strategic realities of warfare (Cummings, 2006, pp.23-31). From this perspective, the role of modern strike technology on the battleground is quite functional. The Karabakh example indicates that UAVs/UCAVs have redefined the concept of classic military superiority by offering high-impact attack capabilities. Taking the issues into consideration, Azerbaijan has pursued a war strategy aimed solely at reestablishing its legitimacy on its own territory, while respecting the internationally recognized borders of the opposing side.

More than that, the fact that Israel and Türkiye, which often disagree on national and regional interests, have not previously been interactively evaluated in the context of Azerbaijan in terms of their UAV/UCAV systems highlights the originality of the subject and serves to fill gaps in the literature.

1. Novel Means of Modern Warfare: Armed and Unarmed Unmanned Aerial Vehicles

As the security scene has shifted dramatically in recent years, conflicts have been increasingly characterized by internal frictions and chameleon-like components. This situation has become particularly evident in the ambiguity of modern hybrid conflicts. Thus, layers of complexity have been added to existing tactics and operations, and new means of warfare have gradually become more effective in strategic calculations. Among these tools, UAVs and UCAVs are the most influential instruments that have transformed today's wars into a totally different dimension. As such, what have the dynamics that have led to the availability of these vehicles? Before talking about UAVs and UCAVs, it would be appropriate to briefly mention the concepts of hybrid warfare and cyberspace in this context.

Those who have studied the concept of hybrid warfare are primarily academic military experts and theoreticians of international relations, who have claimed that the 21st century will be a period in which hybrid warfare will become widespread (Glenn, 2008, p.73). Analysts define hybrid warfare as a strategy of war that seems too simplistic to destroy the opponent's objectives, but, when used in combination, it has the capacity to undermine all the important values of the other side. In this strategy, both conventional and nonconventional power is used by state and nonstate actors or groupings at the same time in a coherent and coordinated manner (Josan & Voicu, 2015, p.50).

Therefore, Gerasimov labelled hybrid warfare as a fusion of soft and hard power elements in various fields, capable of disintegrating even the most advanced state (Rumer, 2019, p.3). Frank Hoffman said that hybrid warfare is a mixture of fanatic and irregular warfare, involving low-level conventional forces and special operations by sophisticated campaigns, acts of cyber warfare, and psychological actions using social and traditional media to influence people (Hunter & Pernik, 2015, p.3). As for cyberspace, it is neither entirely new nor out of controlled sphere. It has now emerged as a global socio-technical-economic system with significant implications for the physical, economic and social security of nations. Additionally, cyberspace has made it simpler for attackers, via allowing states and non-state actors to remotely access other societies, threaten critical government systems, and affect the core operations of both public and private institutions (Dombrowski & Demchak, 2014, p.73). After briefly defining these two dynamics as factors that expand the field of operation of UAVs/UCAVs, the following question needs to be answered. What is UAV?

UAVs, commonly referred to as drones, are a relevant tool of choice for hybrid actors (Sprengei, 2021, p.11). UAVs or drones, considered to be a more advanced type of aircraft have been tested and approved by the Military Factory, are defined as an aerial vehicle that does not employ a human navigator, utilizes aerodynamic forces to raise the vehicle, and can fly independently or be controlled remotely (Military Factor, 2024). These vehicles, which are referred to in research as drones and sometimes as UAVs, have historically been labelled as any unmanned vehicle remotely by an operator on the ground.

UAVs are often used either for gathering intelligence or guided missiles and explosives. In this context, some sources suggest that the first recorded UAV or weather balloon was used by the Austrians in Venice in 1849 to suppress a riot in which balloons were used to drop explosives into the city (Khalilzada, 2022, p.92). A different source points out that the first UAV originated from a radio-controlled aircraft called the "Queen Bee". It was the first reversible and reusable UAV developed in the United Kingdom and used in air/sea artillery applications (Keene, 2015, p.2).

As can be understood, drones, which are frequently mentioned in the context of modern wars, are a tool with a more profound history. In fact, there is information that these tools were

utilized during two world wars, which had a major impact on world history. In this regard, during the First World War, the United States commenced using pilotless aircraft as practice targets or missiles, and many UAVs were developed from scratch or converted to conventional manned aircraft. Radio-controlled B-24s were also used during the second World War to fulfil bombing missions over Germany (Bartsch, Coyne & Gray, 2018, p.27). However, in that period, their main use was only for targeting aerial goals, and they did not reach their full potential in non-target areas until the late 1950s and early 1960s. Subsequently, the actual breakthrough of UAVs in warfare came in the period after 1995, with the evolution of the Gnat, an American UAV, later renamed the Predator, with a 12-meter wingspan, that can hover over a target for up to 12 hours and transmit live video feeds (The Week, 2021). Since then, the range of UAVs/drones has expanded and emerged the new types starting from combat drones to kamikaze models. Furthermore, some drones can disrupt the enemy's air defences and communication systems, and these make them even more in demand vehicles. Unlike previous technological developments, it is noteworthy that these drones are more agile, accessible, affordable, adaptable and more capable of anonymity (Falk, 2021). This is termed the "five A's" (agile, accessible, affordable, adaptable, anonymity) of UAVs in the military lexicon (Bartsch et al., 2018, p. 3).

Overall, the combination of their increasing utility in military campaigns and the rising number of nations deploying them has given UAVs a vibrant character on the current warfighting landscape. Thus, Michael J. Boyle categorized the arguments for the effectiveness of drones based on four separate claims (2013, p. 4):

1. UAVs are an effective vehicle for eliminating terrorists with minimal civilian casualties.
2. UAVs are successful in obliterating designated high-value targets.
3. The deployment of UAVs exerts such pressure on terrorist organizations and the aggressor state that their organizational capacity and offensive capabilities are diminished.
4. The cost-benefit analysis of the usage of UAVs, such as the deployment of ground troops, provides compelling arguments for the other side.

Based on the arguments, it is enabled to say drone systems have become an integral part of recent wars. The last Karabakh War is the most obvious example of this. Based on the foregoing, it can be said that the UAV/UCAV system has provided advantages for Azerbaijan in four categories. Initiating from the first category, due to UCAVs, Azerbaijan was able to neutralize the targets of the Armenian army with precise strikes; ammunition depots, air defense systems and artillery batteries at points far from civilian settlements were hit with high exactness, while civil casualties were kept to a minimum, which gave Azerbaijan the strategic advantage of legitimacy in the international arena. Focusing on the second point, Azerbaijani UCAVs have carried out attacks using Harop drones to strike strategic objectives and Bayraktar TB2 drones to take out armored vehicles and other objectives. Because of these attacks, Armenia lost ten S-300s and their tactical combat vehicles, 366 tanks, 352 artillery pieces of various calibers, 22 unmanned aerial vehicles, five Su-25 aircraft, and 50 "Tor," "Osa," "Kub," and "Krug" model anti-aircraft missile systems (Güner, Babayev & Safarov, 2022, p.16). Such achievements created psychological superiority in the Azerbaijani Army, while causing serious disruptions in Armenia's logistics and personnel transportation (Hashimov, 2022, p.32). This was the third-phase gain for Azerbaijan. Finally, when evaluated in terms of cost-benefit analysis, since there is no risk of pilot loss in operations carried out with UAVs, and observation and attack can be carried out 24 hours a day, Azerbaijan has both reduced human losses and optimized the cost of war (Novichkov, 2021, p.124).

To sum up, in the Karabakh War, UCAVs were the key to establishing asymmetric superiority; this technology, as an element that changed classical war doctrines, provided Azerbaijan with rapid progress, low casualties, the perception of righteousness in international public opinion and psychological dominance. Therefore, it is useful to examine the two different

faces of these attack weapons used in the 44-day Karabakh War, as it is one of the clearest situations that concretely demonstrates the impact of UAVs/UAVs in modern warfare.

2. Two Distinct Aspects of the 44-Day Karabakh War: Bayraktar TB2 and Harop

In the following, the UAV systems of Türkiye and Israel, which are directly related to the subject of this article, will be discussed in detail, especially in the axis of the Bayraktar TB2 and Harop drones which were used during the Karabakh War.

2.1. The Evolution of the Turkish UAV System: Bayraktar TB2

The recent performance of Türkiye in the defence and security sector has attracted considerable focus on Bayraktar UAVs and UCAVs. Before discussing this UAV, which can be characterized as Türkiye's golden strike in this field, it would be appropriate to mention the facts in the historical background.

The terrorist incidents that Türkiye has been encountering since the late 1980s propelled it into a new quest in the 1990s, and it was concluded that UAVs could play an essential role in curbing terrorist acts. As emphasized previously, this is largely because UAVs have become more prominent on the battlefield since 1995, and new types of UAVs have been transformed and introduced to modern nation states. In this manner, Türkiye initiated efforts to include UAV systems in the inventory of the Turkish Armed Forces (TAF) and the Banshee system, the first UAV produced by Meggitt, was introduced to the TAF in 1989. In the 1990s, the TAF also launched a military modernization program worth $150 billion over 30 years, of which $60 billion belonged to the land forces (Satana, 2008, p. 367). Within the scope of this program, the TAF's UAV inventory was later expanded, which was followed by Germany's donation of five CL-89 UAVs in 1993 (Aksan, 2020). Although these UAVs were operational in 1994, they were removed from the inventory due to logistical problems that emerged. This was followed by the inclusion of six GNAT-750s and two I-GNATs in the TAF inventory in 1995, according to the Sector Assessment Report, and these UAVs were in service until 2005 (2016, p.33).

From this point of view, since the Turkish defence industry was dependent on foreign countries, especially in the field of UAVs, it was aimed to become self-sufficient in this field, and the Turkish Aerospace Industry sector concluded that it was time to initiate a national era in this field to minimize dependence. In line with this vision, the Turkish Defence Industry underwent a strategic transformation in the 2000s to achieve self-sufficiency (Tombak, 2024, p.1598). This means that if in the past Türkiye covered its defence requirements entirely relying on imports, in the last 20 years the situation has been completely reversed. Especially in the period after 2004, the Undersecretariat for Defence Industries (UDI) agreed to establish an industrial infrastructure for the development of UAV systems in parallel with the consultations and studies conducted. The main objective of such steps taken by the UDI was to increase the domestic coverage of Türkiye's defence expenditures to 50% in the short term, within six years, a target that was achieved in 2010, and even surpassed 52% (2011, p. 22).

Amid the efforts to develop the local UAV industry, Türkiye, in its fight against the terrorist organization of PKK in the southeast of the country, thought that UAVs would be effective in detecting the militants, and an agreement was reached in 2005 for unarmed Heron UAVs supplied by Israel Aerospace Industries (Düz, 2020, p.9). The equipment was, however, delivered too belatedly by the Israeli authorities. It was planned that these UAVs would remain in the air for hours to determine the precise location of the PKK terrorists, and then F-16 fighter jets would be sent to conduct an attack. Unfortunately, when the UAVs were put into operation, they did not yield the outcomes that Türkiye expected, due to deficient components (Hoffman, 2020). As such the Turkish government sought to purchase US UCAVs that could strike on the spot, but due to the Arab Spring Türkiye's relations with Israel have become increasingly

confrontational. And US concerned that the technology which Türkiye wants to gain could be used against Israel. Hence, the US Congress declined to ratify the drone sales to Türkiye in 2010 and 2012. While Türkiye has been trying to obtain its UAV supply from abroad, it has also initiated domestic UAV projects and achieved significant strides in this direction.

Meanwhile, the Turkish Aerospace Industry (TUSAS) has produced many prototype UAVs, including the first indigenous UAV TAI-UAV-X1 (1992); Turna-Keklik (1996); and Pelikan-Martı (2003). In parallel, Turkish manufacturers accelerated their research, development and production of UVS systems, with TUSAS-ANKA and Baykar working on the Bayraktar TB2 platform (Kınık & Çelik, 2021, pp.177-178). In December 2004, TUSAS received a contract from the TAF for the development and procurement of the indigenous MALE UAV system under the Turkish Unmanned Aerial Vehicle (TUAV) program (Çetinkaya and Koç, 2023, p.9). Anka, which finalized its pre-design development (PDR) in May 2008, was unveiled in July 2010 at the Farnborough Air Fair. The UAV conducted its first take-off flight in December 2010 and demonstrated its capabilities for automated take-off and landing in November 2011. During the final series of tests in September 2012, the prototype vehicle crashed because of a technical problem, and TUSAS was only able to complete the Anka's acceptance test campaign in January 2013 (Airforce Technology, 2013).

An essential milestone in this country's indigenous drone program is the Bayraktar UAV system. The Bayraktar Mini UAV System was developed as Türkiye's first mini robotic system that is completely indigenous with its modular design, easy installation feature, composite structure and electronic, software and structural components of the aircraft. The second round of upgrading and serial manufacturing of the Bayraktar Tactical Block 2 (TB2) commenced in January 2012, with the initial flight of the Bayraktar TB2 taking place on April 29, 2014 (Cevher, 2023, p.188). Bayraktar TB2 is a tactical UAV that can perform Intelligence, Surveillance and Reconnaissance (ISR) and weaponized strike missions. An on-board avionics unit with a triple redundant avionics system covers take-off, landing and navigation. In addition, TB2 has demonstrated its efficiency with over 750,000 operational flight hours (Baykartech, 2024). The TB2 UAV, which is equipped with indigenous hardware such as the MAM-L and MAM-C laser-guided smart munition systems, simultaneously performs target acquisition operations as a forward observer, air controller and fighter (Kaya, 2022, p. 4).

As highlighted before, due to such an equipped capability, Bayraktar TB2 has evolved into the most widely used UAV system for ensuring security in both national and regional affairs. Accordingly, the TB2 was first used in 2016 against the terrorist activities of the PKK in Türkiye, supporting the advance of ground forces and maintaining a constant armed presence in the areas of operation. In addition, Türkiye utilized the TB2 system to link reconnaissance and strike capabilities while conducting various operations in northeastern Syria between 2016 and 2019. Furthermore, in 2019, the Lebanese territory has emerged as the main area where TB2 will be deployed by an actor other than Turkish forces (Peigne, 2023, pp. 3-4). In the axis of South Caucasus, TB2 played a critical role in shaping the outcome of the conflict during the last Karabakh ar.[2]

The domestic and cross-border use of the Turkish UAV has made it a success story within the country's borders, while its export to the outside of battlefields has drawn attention in the context of growing national defence industry. Especially after its achievements in modern wars, the demand for Bayraktar TB2 has increased, and the Turkish defence technology company Baykar announced that the Bayraktar TB2 UCAV has been sold to Qatar and Ukraine (Bakır, 2019, p.132), as well as Azerbaijan and Libya. It has even come to the fore that this UAV will be purchased by Poland, which is confirmed in a statement made by the Polish Defence Minister. It

[2] The role of Bayraktar TB2 in the 44-day Karabakh War, which is the focus of this article, will be detailed in the next sub-heading.

was one of the issues that Poland, which is the member of NATO, would purchase 24 UCAVs from Türkiye (Öncel, 2021, p.1). In parallel with these advancements, Baykar has accelerated its work on the Bayraktar TB3 system, which can carry out armed operations abroad with special functions such as foldable wings that can be used on aircraft carriers, and can be deployed from very long distances thanks to its beyond-line-of-sight communication capabilities (Baykartech, 2024).

Ultimately, it can be concluded that the use of military technology not only enhances Türkiye's credibility in the regional arena but also has enhancing effects on the survival of the domestic regime. This is embodied in three strategies (Soyaltin-Collelaa & Demiryol, 2023, p. 3):

1. Fostering tech-nationalism and pride in the nation.
2. Reinforcing regional stability and bolstering territorial cohesion.
3. Responding to emerging global realities.

In the context of this strategy, the success of Turkish drones in government-controlled media channels promotes the realization of the arms deal abroad and it allows Türkiye to resemble itself as an alternative source of military technology in configurations based on self-sufficiency. Türkiye's effective use of drones in the operations of counterterrorism and regional conflicts also contributes border security and its endeavours of regional order. From this standpoint, it would be appropriate to scrutinize the role of Bayraktar TB2 in the recent Karabakh war for comprehensive understanding of the issue.

2.2. The Evolution of the Israeli UAV System: Harop

Considering the demands of national security in contemporary international relations, Israel strives to maintain a leading position in military innovation and seeks to transform the battlefield with new military technologies. Among the technologies developed by this state, the UAV has a unique prominence. Because while other countries were experimenting with these vehicles, Israel developed and deployed them as battlefield systems.

The entrance of UAVs into Israel's defence system, which has become a prominent element of modern warfare, dates to the bygone. Although Israel used them for photography as early as the 1960s and 1970s, it started to look for ways to incorporate unmanned vehicles into its defence system during these years. Indeed, the emergence of unmanned vehicles resembles the early stages of computer development in the United States, the idea that it could be transformed into a military tool gained momentum with the research of American Alvin Ellis. Ellis then relocated to Israel in 1967 and became a member of the Israel Aircraft Industries (IAI). Here he designed a prototype UAV with his IAI colleague Yehuda Manor (Sanders, 2002, p. 115).

Following the rejection of this prototype UAV by IAI, the duo sought support from a state-owned company, and Ellis approached Tadiran, a private electronics company, which funded the project. After the prototype UAV was flown in 1973, Tadiran was contracted to develop an operational model of the Mastiff in a pusher-propeller twin configuration, a feature that would eventually become standard for combat surveillance (Sanders, 2002, p. 115). This unmanned vehicle did not receive enough attention for a while, but eventually the Israeli military was interested, and Tadiran and IAI competed fiercely for a defence contract to develop and produce the vehicle. Afterwards, the Israeli Ministry of Defence purchased Mastiffs from Tadiran, while IAI supplied the Scout model with a similar configuration to the Mastiff. The main reason for this was that during the First Lebanon War, Syria began to install SA-6 surface-to-air batteries in the Bekaa Valley (Borg, 2021, p. 407). As a result, an Israeli fighter was shot down, as well as several Mastiffs and Scouts that were on board. In turn, drone intelligence gathering over many years enabled the Israeli Armed Forces to devise a detailed attack plan (Ehrhard, 2000, p. 197).

In this situation, Tadiran organized a team with IAI and then submitted a proposal in 1984 for a model to cover US military requirements. Several important dynamics have played a crucial role in achieving these goals. The first one, beyond technological breakthroughs, is related to the opportunities provided by geographical conditions. The second is related to regional borders and Israel's geostrategic position (Borg, 2021, p. 411). All these opportunities positively affected the development of the Israeli drone system, and in this context, the Pioneer drone, jointly built by the US AAI Corporation and Israel's IAI, was purchased for the Israeli navy in 1985. Following this, Pioneer surveillance drones were purchased from Israel in January 1991 and used by the US Navy in the First Gulf War to guide projectiles fired from warships. On February 16, 1992, an Israeli Scout drone was also used to attack a convoy of vehicles in South Lebanon, targeting and killing Hezbollah leader Sheikh Abbas al-Moussawi. In April 2000, Israel's newest Searcher II UAV, capable of longer-range flights of hundreds of kilometers, began flying over Lebanon. Thereafter, Israeli forces withdrew from Lebanon, providing air support with UAVs (Dobbing & Cole, 2014, pp. 9-10).

Understandably, over time, Israeli UAVs and UCAVs have turned into a tool of interest for regional and international actors and have become part of the armed forces' inventory. Israel therefore produces and exports various types of unmanned aerial systems on a large scale, including tactical mini-UAVs operated by ground forces, such as Elbit Systems' Skylark. In parallel, Israel has diversified its strategy to develop the production of UAVs and UCAVs, and a UAV Management system has been established. This administration provides a strategic advantage to the Israel Defence Forces (IDF) and the Directorate for this management was established in 2001 under the Ministry of Defence DDR&D (Ministry of Defence of Israel, 2024). Additionally, the IDF's land and naval forces also operate a separate UAV system. These are divided into a three-tier system according to their technical capabilities: advanced, medium and lower (Ministry of Defence of Israel, 2024). Advanced UAVs include the Eitan (Heron TP or Heron 2). It can take off at a maximum altitude of 40,000 feet and has a length of 15 meters and a wingspan of 26 meters. Medium UAVs include the Hermes 450, Hermes 900 and Shoval. They serve as tactical layers designed for long flight durations, suited to the needs of the Air Force, Army, Navy and Intelligence. It can take off at a maximum altitude of 20,000 feet. Lower-level UAVs operate at a maximum altitude of 5,000 feet and weigh 10 kg (Ministry of Defence of Isarel, 2024).

Along with these remotely flown and operated systems, Israel also constructs and exposes UAVs, with self-driving fire-and-forget systems. They have technical capacities that enable drones to operate by flying, hovering, tracking and, if required, destroying a target in a kamikaze manoeuvre. It involves minor or no human intervention. The Harpy NG and Harop manufactured by IAI are some of the standout systems in this categorization (Antebi, 2018, p. 76). Released from a surface vehicle at the edge of the war zone, the Harpy is a self-propelled autonomous weapon that is suitable for all weather conditions and has a day/night "Fire and Forget" capability. In other words, the Harpy LM identifies strikes and eliminates enemy radar radiators (IAI, 2024).

Harop LMs, which function as electro-optically guided attack weapons, are launched from ground-based launchers and then controlled via a full-cycle two-way digital link. This UAV features a flight duration of 6 hours and a 1000 km range. In addition, it is launched from land and sea with box launchers. However, there is also the possibility to customize the drone to be launched into the air from airplanes (Islamic World News, 2024). Harop was originally conceptualized by IAI between 2001 and 2003 and was first displayed publicly at the Indian Air Show in 2009. Incidentally, the Army of India concluded a $100 million deal to purchase 10 Harop UAVs. In this contract, details of which were not announced, the figure stated for each drone was 10 million dollars (Islamic World News, 2024). It is also known that this drone is in the inventory of not only India, but also Germany and Azerbaijan (Wenz, 2015).

3. The Karabakh War and the Milestone of Victory: Harop and Bayraktar TB2

During the year 1988, Armenians commenced making territorial claims against Azerbaijan, using the excuse that the Armenian population was numerically superior in the mountainous regions of Karabakh, which led to a conflict between the two countries in the South Caucasus (Alizada & Kocatepe, 2024, p.121). As a result, the Armenian armed forces seized 20 percent of Azerbaijan's territory, including the Karabakh region with its seven surrounding districts (Sarıkaya, 2020, p.8). A ceasefire agreement was signed between the two countries in 1994, during this period, the OSCE Minsk Group co-chairs Russia, France and the United States continued to pursue peace talks between the parties.

The conflict known as the Four-Day War or April War in Azerbaijan's history may be considered the starting point on the road to this state's great victory (Asker, 2021, p.118). During the intensifying war, surveillance and reconnaissance missions of advanced military hardware, including UAVs, were utilized extensively in ground attacks (Sapmaz, 2021, p.12). If for a long time the use of UAVs was an unaffordable luxury, especially in the post-Soviet period, now that parallel to the changing geopolitical environment, these modern drones have become an accessible tool not only small but economically self-sufficient states. The four-day war that took place in April 2016 may be the first interstate armed conflict in the South Caucasus in which UAVs were deployed specifically for combat missions. According to the statement of the Ministry of Defence, Azerbaijan successfully used various types of unmanned aerial vehicles such as "Thunder B", "Orbiter 2M", "Aerostar", "Hermes 450" and "Heron-1" during the war (Ilic & Tomasevic, 2021, p.10).

It is understandable that UAVs and UCAVs are included in the military inventory of both countries involved in the conflict. At this point, it is necessary to mention the Israeli Harop and Turkish Bayraktar TB2, which constituted the turning point in the 44-day Karabakh War. Before touching on this issue, however, it would be appropriate to elaborate on the process of acquiring UAVs/SUAVs in the context of military-strategic relations in the Israel-Azerbaijan-Türkiye triangle. Despite being a country with a Muslim majority, Azerbaijan has a secular government structure, and its relationship with Israel is considered quite close by academics. This is because the defence ties between these two states go significantly beyond arms dealing and technology transference, which ensures the successful integration of a strong governmental component, strategy and military management between the parties (Idan & Shaffer, 2021, p. 198). Even though some analysts characterize these relations as an arms-for-oil trade, it can be said that this is a strategic alliance created in parallel with the Iran-Armenia partnership. For this reason, Israel has emerged as the largest arms supplier, accounting for approximately 70 percent of Azerbaijan's defence imports (Kınık & Çelik, 2021, p.176).

In this context, nearly all varieties of Israeli unmanned aerial vehicles are present in Azerbaijan's arsenal. In 2008-2009, Azerbaijan imported abundant UAVs from Israel, such as Hermes 450, Aerostar and Orbiter M. Afterwards, the Ministry of Defence Industry of Azerbaijan initiated the production of Orbiter M and Aerostar UAVs with the Israeli company Aeronautics Defence Systems Ltd. (Mamedov, 2015). In March 2011, the new AZAD Systems enterprise of the Sharg production unit of the Azerbaijani Ministry of Defence Industry was launched. Five production installations were created at the enterprise. Subsequently, this enterprise started producing Orbiter and Aerostar UAVs (Fedutinov, 2016).

While Azerbaijan was trying to strengthen its defence industry together with Israel, it also accelerated the process of integrating Israeli UAVs and UCAVs into its own inventory, and Azerbaijan was among the states interested in the Harop, which was exhibited at the international air fare in India, 2009 (Fedutinov, 2016). From this period onwards, Israel-Azerbaijan relations, which have mutually transformed into strategic military cooperation, reached milestones in the field of defence. The first of these was the agreement signed in February 2012. This agreement

includes the supply of $1.6 billion USD of Israeli UAVs, anti-aircraft and missile air defence systems. Another major turning point was the visit of Israeli Prime Minister Netanyahu to Azerbaijan in December 2016. During Netanyahu's visit, President Ilham Aliyev announced the signing of a new massive arms deal between the two countries worth about 5 billion dollars (Idan & Shaffer, 2021, pp. 199-200).

After briefly mentioning the relations between Israel and Azerbaijan in the field of defence, it would be appropriate to elaborate bilateral relations between Türkiye and Azerbaijan, which have developed through the "One Nation, Two States" strategy. The fact that there are ethnic, cultural, religious and linguistic affinities between these two states. After Azerbaijan announced its independence, the Republic of Türkiye was the first state to recognize Azerbaijan, and the relations between parties have been improved in the political-social-economic-military sphere since then. When it comes to defence cooperation between the parties, the turning point is the Strategic Partnership and Mutual Assistance Agreement signed between Azerbaijan and Türkiye in 2010. Under the agreement, the two countries pledged to support each other in every possible way in the event of an attack by a third country and agreed to conduct joint military exercises (Isachenko, 2020, p. 2). In the scope of this agreement, concrete steps have also been made efforts towards the integration of Turkish military discipline into the Azerbaijani defence field. As a result of the continuous training and education process, the Azerbaijani army has developed a strong human resource capacity as well as effective operational competencies. Nevertheless, for three decades, the traditions of strict discipline and obedience of TAF replaced the old Soviet influence on the Azerbaijani army. Because the training and education program carried out by the Turkish land forces was implemented by both the naval and air forces (Yalçınkaya, 2021).

In this timespan, the Turkish defence industry has achieved self-sufficiency, especially in the production of UAVs and UCAVs, and as a result, Bayraktar TB2 has become the centre of attention of regional and international actors, as described previously. Azerbaijan, seeking to modernize its military system based on Turkish discipline, planned to acquire Turkish-made UAVs and UCAVs for its armed forces inventory. Following that, in 2020, the Azerbaijani parliament (Milli Majlis) approved a draft law on financial assistance for the purchase of weapons systems from Türkiye. Consequently, Azerbaijan decided to purchase a great number of Turkish-made UCAVs in June 2020, just a few weeks before the eruption of the Karabakh war in 2020 (Berkdil, 2020). As evident, while enhancing its military defence system, Azerbaijan has added UAV and UCAV systems to its inventory in accordance with the conditions of the modern era. This significantly altered the trajectory of the war in Azerbaijan's favour and paved the way for Azerbaijan to gain an unprecedented military superiority during the 44-day war (Ilic & Tomasevic, 2021, p.13).

The first turning point in the escalating process that led to the Karabakh War, which lasted 44 days, was the Battle of Tovuz on July 12-18, 2020. The truce that ended this conflict did not deter Armenia from its aggressive policy; on the contrary, it emboldened to launch a new attack (Asker & Özpınar, 2021, pp.83-106). During this dispute, Israeli weapons, especially the Harop UAV, played an indispensable role in the withdrawal of Armenian military forces. The main objective of this attack was to weaken the energy cooperation between Azerbaijan and Türkiye and to target the Baku-Tbilisi-Ceyhan pipeline, which is used to transport Azerbaijan's hydrocarbon reserves to Europe via Türkiye (Shiraliyev & Hasanoğlu, 2024, p.290). Following Armenia's attack on Tovuz in July 2020, in August 2020, this state committed another military provocation by sending a sabotage group to Azerbaijan to carry out terrorist acts, which constituted the second turning point. However, this group was neutralized on August 23 (Ministry of Defence, 2024). After this sabotage perpetrated by Armenians, Ankara and Baku started to conduct joint military exercises in accordance with the strategic partnership agreement between

them, and the final refinement of military planning was completed, including the positioning of Bayraktar TB2 UCAVs close to the battlefield (Ünal, 2021, p.125).

On September 27, 2020, Azerbaijani President Aliyev declared martial law in the country, and the use of Bayraktar TB2s (Peigne, 2023, p. 4) and other kamikaze UAVs acquired and deployed by Azerbaijan during the war caused the Armenian army to inflict more casualties. From the first days of the conflict, all Armenian anti-aircraft systems were destroyed by UAVs, creating a wide manoeuvring space for Azerbaijani UAV attacks. Azerbaijan then intensified its offensive actions against Armenia, which was unable to protect its ground forces. During this phase, with the target intelligence obtained from UAVs, strategic elements of the Armenian army were effectively attacked with artillery and ballistic missiles.

Following a series of intense engagements, Azerbaijani forces broke the defensive line of Armenian troops by midday on November 7, marked symbolically by Major Gündüz Safarlı's unit raising the national flag over the Shusha City Administration building. This event signaled a turning point in the battle for Shusha, a city of strategic and symbolic significance in the Karabakh region. On November 8, 2020, Azerbaijani forces had secured full territorial control here (Gurbanov, 2025, p.245). A critical enabler of this success was the Azerbaijani military's systematic use of UAVs, which played a force-multiplying role throughout the Shusha offensive. Specifically, Turkish-manufactured Bayraktar TB2 UAVs and Israeli-origin Harop/Harpy loitering munitions were deployed to neutralize Armenian short-range surface-to-air missile systems, including 9K33 Osa and 9K35 Strela-10 units. These platforms, remnants of Soviet-era air defense infrastructure, proved largely ineffective against Azerbaijan's precision-strike capabilities. The UAVs not only provided real-time intelligence and surveillance but also facilitated the surgical targeting of Armenian defensive assets, thereby creating favorable operational conditions for ground advancement (Yeşilot & İnalcık, 2025, p.141).

In the wake of these occurrences, on November 10, with Russia acting as mediator, Armenia announced that it was ready to accept a ceasefire agreement. With that, the strategic balance in Karabakh shifted in Azerbaijan's favour. With that, the strategic balance in Karabakh has shifted in Azerbaijan's favour (Özer, 2025, p.6). Although the terms of the agreement between the parties are clear and Armenia stands to gain significant economic benefits if it is implemented, the intransigent position of the Armenian side led to the occurrence of small-scale conflicts between the parties until 2023. Therefore, anti-terrorist operations were organized by Azerbaijan against these actions and the most important of these operations was carried out in September 2023 (Amnesty International Public Statement, 2023, p.1). The anti-terrorist operation aimed to neutralize the threat caused by illegal armed formations on the territory of Karabakh, and within the scope of the mission, the Azerbaijani side achieved significant successes after receiving intelligence information through the effective use of UAV/UAV systems (Air Center Bulletin, 2023, p.2). After this operation, the so-called self-proclaimed Artsakh administration in Karabakh dissolved itself and its officials were arrested. Realizing that an autonomous entity could no longer be established in Karabakh, most of the Karabakh Armenians migrated to Armenia (Taşçıoğlu, 2023, p.562).

As a result, the 44-day Karabakh war is considered by analysts to be a clear example of how UAVs/UCAVs can change wars and conflicts. Considering its effects, it can be said that the main actor in the 2020 war was the Azerbaijani Armed Forces, with its arsenal of UAV/UCAV systems and its strategic alliance with Türkiye. Simultaneously, this conflict can also be seen as a case study of how UAVs/UCAVs and anti-aircraft technologies enabled a small power like Azerbaijan to gain air superiority and achieve a victory that influenced the outcome of the conflict (Kaya, 2022, p. 7). As a result, in a study conducted by the US-based Global Firepower website, 145 countries were analysed according to their military capabilities, with Azerbaijan ranking 60th and Armenia 91st on the 2025 list (Global Power, 2025). This is a clear indication of how

Azerbaijan's military balance of power has transformed in an upward direction (Özgen, 2021, p.109).

In Lieu of Conclusion: Assessment for the Future

Sometimes referred to as the Final Karabakh War, sometimes as the Homeland War and sometimes as the Great Victory, this war healed Azerbaijan's deeply wounded national psychology and enabled Baku to prove that officially is a major player in South Caucasus in terms of politics, economy, and military. At the meantime, this war also revealed to Ankara that it can resolve the unfolding events in any way, if it concentrates its power and strength on a clearly defined and clear foreign policy objective. As evidenced by the battle footage in news reports, even the most basic tactical operational procedures were neglected by Armenian armoured units.

The 44-day Karabakh war, which is considered a paradigm-shifting event, has revealed some learnings that can be obtained about the role of UAVs/UCAVs in the context of two equivalent states. Especially when the strategic implications of the Karabakh war are evaluated, it has become clear that drone warfare is no longer the prerogative of major states and armed forces with extensive budgets. The fact that a small state like Azerbaijan utilized UAVs/SUAVs effectively during the war reinforces this idea. The other important strategic implication of this conflict is that Western armed forces need to rethink their approach to the control of air power and ground forces. Moreover, Azerbaijan's successful integration of Turkish and Israeli drones into the battlefield during the war necessitated direct communication between Turkish and Israeli experts, and moreover, Türkiye allowed Israel to transport supplies to Azerbaijan through its airspace during the war. This demonstrates that Türkiye and Israel, which have had a volatile relationship, are able to come together when it comes to common interests.

In parallel, Türkiye, which is a strategic ally of Azerbaijan, knows Israel is a major supplier in Azerbaijan's defence sector. For this reason, Türkiye, which has made significant progress in drone production in a short time, plans to become Azerbaijan's most reliable supplier in this field. Under these circumstances, Türkiye's unconditional military and moral support to Azerbaijan, especially during the Karabakh war, has created an essential geopolitical consequence. In this context, the Karabakh war ushered in a new era of stronger bilateral relations between the two countries, and thus the prevailing rules of the political game in Karabakh were changed militarily.

This has strengthened the interaction between Azerbaijan and Türkiye in the field of defence; at the same time, it has also brought advantages for Türkiye in terms of defence economy. Bayraktar TB2 has provided Türkiye with a strong position in the Azerbaijani arms industry, which was previously dominated by Israel, and it has come to the fore that this state will eventually overtake Israel in the supply of weapons to Azerbaijan. Based on such geopolitical implications, the success in the Karabakh war can be read as a serious geostrategic manoeuvre in terms of military superiority, correct timing, withdrawal of Russian support from Armenia, which is experiencing an axis drift towards the West, and the provision of military ammunition, especially from Israel and Türkiye. In any case, this war is the most obvious epitome of the changing nature of warfare in the modern era. Because UAVs are a projection of power and, in the broadest sense, they provide countries with significant financial savings. Moreover, as a means of proxy, it reduces the involvement of military personnel in wars and allows for fewer casualties. Albeit the use of UAVs/UAVs with such advantages by illegal groups should not be underestimated.

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ETİK ve BİLİMSEL İLKELER SORUMLULUK BEYANI

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