

# WEEKLY ANALYSIS

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## REDEFINING MILITARY POWER IN THE AGE OF SMART AND LOW-COST TECHNOLOGIES

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Weekly Analysis is one of the CSRS publications analyzing significant weekly political, social, economic, and security events in Afghanistan and the region. The prime motive behind this is to provide strategic insights and policy solutions to decision-making institutions and individuals in order to help them design better policies. Weekly Analysis is published in Pashto, Dari, English and Arabic languages.



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Center for Strategic and Regional Studies (CSRS)



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## REDEFINING MILITARY POWER IN THE AGE OF SMART AND LOW-COST TECHNOLOGIES

### Introduction

The recent war involving the United States and Israel against the Islamic Republic of Iran has once again brought the role of emerging technologies in contemporary warfare to the forefront of strategic studies. Although major powers continue to enjoy significant advantages in areas such as air power, intelligence, space-based systems, and advanced weaponry, the increasing use of drones, missiles, and other smart and relatively low-cost systems by actors with limited resources has raised new questions about the concept of military superiority and the nature of military competition.

Under such circumstances, a central question arises: to what extent have smart and low-cost technologies influenced the logic of contemporary warfare and the calculations of military power, and what implications have they produced for the balance of power and the economics of war? This article examines these transformations by analyzing the role of smart and low-cost technologies in contemporary conflicts and discusses their strategic implications for Afghanistan.

### TECHNOLOGY AND THE CHANGING NATURE OF WAR

Since the Industrial Revolution, technology has become one of the most important factors shaping the nature of warfare and determining its outcomes. Over the past two centuries, states that have been able to develop new military technologies more rapidly and integrate them effectively into the structure of their armed forces have generally achieved a considerable advantage on the battlefield. Conversely, states that have lagged behind this process have often faced serious vulnerabilities and military defeats.

In the twentieth century, great powers no longer defined military superiority solely in terms of the number of troops or the volume of equipment. Rather, the capacity to produce, develop, and innovate military technologies also became one of the principal indicators of power. This trend significantly intensified technological competition among major powers. The emergence of nuclear weapons ushered the arms race of the Cold War into a new phase, whereby the United States and the Soviet Union defined a substantial part of their deterrence capability and strategic standing on the basis of nuclear power and the destructive capacity of their arsenals.

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From the 1970s onward, the United States, by taking advantage of the information technology revolution, initiated a broad transformation in military planning, command-and-control networks, communication systems, and satellite technologies. This transformation provided the United States with a significant advantage in areas such as stealth aircraft, precision-guided munitions, the Global Positioning System (GPS), and intelligence networks. The effects of this superiority were clearly demonstrated in the Gulf War of 1991 and later during the invasion of Iraq in 2003, when U.S. forces were able to defeat the Iraqi army and capture Baghdad within a short period of time.

However, the very technologies that had constituted the principal strategic advantage of great powers for several decades gradually created the conditions for the emergence of new challenges. The expansion of commercial technologies, the declining cost of producing smart equipment, and easier access to advanced technologies meant that tools once monopolized by major militaries increasingly became available to smaller actors as well.

The recent confrontation involving the United States and Israel against the Islamic Republic of Iran revealed an example of this transformation. Although the United States, relying on its most advanced aircraft, intelligence systems, precision missiles, and air capabilities, was able to inflict considerable damage on some of Iran's defensive capacities, it was unable to achieve a rapid, low-cost, and decisive victory comparable to its experience in Iraq. In contrast, Iran, through the use of missiles, drones, and other smart and low-cost systems, was able to increase the operational costs for the opposing side. This conflict demonstrated that, in contemporary warfare, inexpensive technologies can also influence the course and calculations of war alongside advanced military equipment.

In other words, the central transformation lies not in the declining importance of advanced technologies, but rather in the expanding accessibility of smart and low-cost technologies. Technologies that were once exclusive instruments of military superiority for great powers have now also become tools for narrowing the power gap and enhancing the deterrence capacity of actors with limited resources.

#### **LOW-COST AND SMART WEAPONS**

Within the literature of military studies, there is still no single universally accepted definition of "low-cost weapons." Nevertheless, the term is generally used to refer to



systems and equipment that, by relying on commercial technologies, simpler production processes, and lower manufacturing costs, are capable of producing significant operational or strategic effects on the battlefield. The value of such weapons does not lie merely in their low price; rather, it is rooted in their capacity for mass production, rapid replacement, ease of use, and ability to impose damage disproportionate to their cost of production.

A considerable portion of these systems has been developed on the basis of technologies originally designed for civilian purposes, including advanced sensors, digital cameras, positioning systems, networked communications, robotics, and, in recent years, various applications of artificial intelligence. The widespread availability of these technologies in commercial markets, together with the declining cost of access to them, has enabled actors with limited resources to employ them in military domains through relatively modest technical modifications. As a result, many capabilities that were once the exclusive preserve of advanced armed forces are now accessible, at substantially lower cost, to a much broader range of actors.

The strategic significance of this transformation also lies in the fact that it has challenged some of the traditional foundations for assessing military power. In the past, military superiority was largely evaluated on the basis of indicators such as defense budgets, the number of heavy weapons systems, the quantity of advanced aircraft, and the industrial capacity of states. However, the proliferation of smart and low-cost weapons has demonstrated that actors with limited resources can also, through targeted investments in emerging technologies, impose considerable costs on more powerful rivals and partially reduce existing gaps in the balance of power.

This transformation, however, does not imply the disappearance of the advantages enjoyed by major powers. Advanced states continue to maintain significant superiority in areas such as air power, space-based systems, strategic intelligence, advanced defense industries, and complex technologies. Nevertheless, developments in recent years indicate that success in contemporary warfare no longer depends solely on possessing the most expensive equipment. Rather, the ability to innovate, produce at scale, adapt rapidly to emerging technologies, and employ them intelligently has also become a fundamental component of military power.

In other words, low-cost weapons are not a substitute for advanced weapons, but rather a complement to them. What is changing is the logic governing the use of military



power: a logic in which efficiency, speed of production, flexibility, and the cost-effectiveness ratio have become increasingly important in the strategic calculations of states and armed forces.

#### **SMART AND LOW-COST WEAPONS AND THE TRANSFORMATION OF THE ECONOMICS OF WAR**

The proliferation of smart and low-cost weapons is not merely limited to the emergence of a new generation of military equipment; rather, it reflects a broader transformation in the economic logic of warfare. The strategic value of these weapons derives primarily from the combination of three fundamental characteristics: low production cost, capacity for mass production, and the ability to generate operational effects disproportionate to their manufacturing cost. These features have led to a reconsideration of many traditional assumptions regarding the relationship between military expenditure and combat power.

In the classical model of warfare, maintaining military superiority required substantial investment in technological development, the production of complex equipment, and the establishment of extensive industrial infrastructure. Accordingly, states possessing greater financial and industrial resources generally enjoyed superior military capabilities. Although this logic remains valid in many areas of military affairs, the spread of smart and low-cost technologies has demonstrated that technological superiority alone does not necessarily guarantee economic superiority in war.

One of the most important implications of this transformation is the changing ratio between the cost of attack and the cost of defense. In the past, the side possessing more advanced equipment could usually maintain its superiority at a relatively proportionate cost. Today, however, in many conflicts, actors with limited resources are able to employ large numbers of smart and low-cost systems in ways that compel their adversaries to rely on highly expensive defensive systems. Under such conditions, even if most of these threats are intercepted and destroyed, the cost of defense may far exceed the cost of attack.

This dynamic can be observed in the confrontation between loitering munitions and advanced air-defense systems. For example, the production cost of a Shahed-136 drone is extremely low compared with the price of a fifth-generation F-35 fighter aircraft or even advanced interceptor missiles. Clearly, such a drone is not comparable to advanced fighter aircraft in terms of speed, accuracy, operational range, or destructive power. Its



advantage lies elsewhere: in its capacity for mass production and its ability to impose costs on the adversary. When hundreds of drones are deployed simultaneously, the defending side is compelled to use sophisticated interception systems and expensive missiles to counter each of them. As a result, even if all the drones are destroyed, the attacker may still achieve one of its objectives—namely, increasing the adversary’s economic and operational costs. From this perspective, the effectiveness of such weapons should not be assessed solely on the basis of the physical destruction they cause, but also in terms of their impact on the economic and strategic calculations of war.

Therefore, the current transformation should not be understood merely as the replacement of one type of weapon with another; rather, it should be regarded as a shift in the economics of war. In the new security environment, military success depends more than before on the ability to manage resources, increase the speed of production, sustain supply chains, and establish a favorable relationship between cost and effectiveness. For this reason, alongside the quality of military equipment, the “economic efficiency of military power” has become one of the decisive components in assessing the warfighting capacity of states.

#### **EMPIRICAL EVIDENCE: THE WAR IN UKRAINE AND DEVELOPMENTS IN THE MIDDLE EAST**

Developments in recent years demonstrate that the role of smart and low-cost weapons is no longer merely a theoretical proposition; rather, it has become an undeniable reality on the battlefield. The war in Ukraine and conflicts in the Middle East represent two prominent cases showing how the proliferation of these technologies has influenced military calculations, the costs of war, and the balance of power.

**The War in Ukraine: Shifting the Balance through Innovation:** The war in Ukraine constitutes one of the clearest examples of the transformation of warfare in the twenty-first century. At the outset of the war, Ukraine faced a considerable gap vis-à-vis Russia in terms of defense budget, industrial capacity, troop numbers, and heavy military equipment. Nevertheless, by relying on innovation, the extensive use of drones, unmanned systems, commercial technologies, and intelligence networks, Ukraine was able to compensate for part of this asymmetry.

The widespread use of drones in this war has not been limited to reconnaissance operations. Rather, drones have played an important role in target identification, fire



direction, precision strikes, disruption of logistical lines, and even attacks against targets deep inside Russian territory. This experience demonstrates that military effectiveness increasingly depends on the ability to integrate technology, information, and innovation, rather than relying solely on heavy and conventional equipment.

Russia, in turn, rapidly adapted to the new conditions and, in addition to expanding domestic production, placed the extensive use of low-cost drones at the center of its operational approach. This trend indicates that even major military powers have been compelled to adjust their force structures and equipment models to the requirements of modern warfare. For this reason, the war in Ukraine may be regarded as a testing ground for a new generation of military technologies, in which the speed of innovation and production capacity have become as important as firepower.

**The Middle East: Increasing the Costs for Superior Powers:** Developments in the Middle East further confirm this trend. In recent years, both state and non-state actors have increasingly employed drones, low-cost missiles, and other smart systems to increase pressure on militarily superior powers. In many cases, the primary objective of such attacks has not been to achieve conventional military superiority, but rather to impose economic, operational, and political costs on the adversary.

The Houthi attacks on shipping lanes in the Red Sea and on various targets in the region represent an example of this approach. Although this group is not comparable to major powers in terms of overall military capability, its use of smart and low-cost weapons has noticeably increased the costs of protecting maritime routes and maintaining regional security for the United States and its allies. This experience shows that, in some cases, strategic success does not depend solely on the level of damage inflicted on the adversary; the ability to alter calculations and impose costs can also contribute to the achievement of strategic objectives.

The recent confrontation involving the United States, Israel, and the Islamic Republic of Iran can also be analyzed within this framework. This confrontation demonstrated that, although major powers continue to possess clear superiority in areas such as air power, intelligence, electronic warfare, and precision weapons, other actors can also rely on smart and low-cost systems to increase some of the costs associated with this superiority and prevent tactical achievements from being easily translated into political or strategic success.



This reality, however, should not be interpreted as meaning that the military superiority of major powers has disappeared. What has changed is the nature of military competition. In contemporary warfare, success depends more than before on adaptability, innovation, continuous production, and effective resource management.

#### **INNOVATION AND ADAPTABILITY: A NEW COMPONENT OF MILITARY POWER**

The proliferation of smart and low-cost weapons does not signify the end of the role of advanced weapons. Military power continues to rest on components such as air power, naval capabilities, space-based systems, and intelligence assets. What has changed is the manner in which these components interact with emerging technologies.

On this basis, possession of smart and low-cost weapons alone does not create a strategic advantage. What is decisive is the ability to integrate these technologies into the structure of the armed forces, adapt military doctrines to new capabilities, and establish coherence among technology, organization, and human resources. A state that merely purchases new equipment, but fails to institutionalize it within its command system, training framework, operational planning, and defense structure, will not be able to benefit from the real advantages of this transformation.

For this reason, the concept of “military innovation” has gained a prominent place in the literature of strategic studies in recent years. Military innovation is not limited to the production of a new technology; it also encompasses the ability to transform technology into operational capability. This process requires the reform of organizational structures, the revision of training methods, the development of new doctrines, and the creation of institutional flexibility to accommodate continuous change.

The experience of the war in Ukraine clearly illustrates this reality. Both parties to the conflict have repeatedly modified their methods of using drones, unmanned systems, and electronic warfare tools within a short period of time. In many cases, the interval between the emergence of a new technology and the development of a countermeasure has been only a few weeks or months. This situation indicates that, in future wars, the speed of learning and adaptation may become as important as the possession of advanced equipment.

Another example of this transformation can be observed in the revision of defense policies by some major powers. Despite possessing the most advanced defense industry



in the world, the United States has in recent years undertaken extensive investments in the development of unmanned systems, artificial intelligence, the mass production of smart munitions, and the strengthening of defense supply chains. This trend indicates that even major military powers have recognized that maintaining superiority is not possible through reliance on expensive technologies alone; rather, it requires continuous innovation, organizational adaptability, and greater strategic flexibility.

Therefore, it can be argued that military competition in the twenty-first century is less a competition over the possession of the most advanced equipment than a competition over the capacity to learn, innovate, and adapt to a changing security environment. The more deeply this capacity is institutionalized within a country's defense structure, the greater its ability to preserve superiority and enhance resilience against emerging threats.

#### **STRATEGIC IMPLICATIONS FOR AFGHANISTAN**

The transformations observed in contemporary warfare are not merely a collection of military experiences from other countries for Afghanistan; rather, they indicate a broader shift in the regional and global security environment. This shift may, in the coming years, affect the nature of threats, the methods of deterrence, and the requirements for developing the country's defense capacities. Therefore, the most important lesson of these developments is not the imitation of other countries' armament models, but rather a reconsideration of how defense power and security preparedness are defined.

Afghanistan faces well-known limitations in terms of financial resources, industrial capacity, and defense infrastructure. Under such circumstances, exclusive reliance on traditional models of military capability development is neither economically sustainable nor fully compatible with the emerging trends of contemporary warfare. The experience of recent years demonstrates that targeted investment in emerging technologies, the development of indigenous capacities, and the training of specialized human resources can, alongside conventional defense capabilities, play an important role in strengthening the country's security resilience.

On this basis, the development of defense capacity in Afghanistan should increasingly rest on human capital, technical knowledge, and the ability to innovate. Technologies such as unmanned systems, artificial intelligence, data analytics, cybersecurity,



reconnaissance systems, and smart communications are not merely military tools; they constitute part of the infrastructure of national power in the modern era. A country that lacks the capacity to understand, localize, and employ these technologies may remain vulnerable to emerging threats, even if it possesses conventional military equipment.

However, the most important transformation required is a shift in the way policymakers conceptualize defense power. In the new security environment, military power is no longer measured solely by the number of forces, the volume of equipment, or the size of the defense budget. Rather, the capacity to learn, innovate, adapt to technological change, and manage resources efficiently has become equally important. Accordingly, establishing linkages among universities, research centers, technology-based industries, and defense institutions can become one of the essential requirements for developing the country's strategic capacity.

Furthermore, the experience of recent wars demonstrates that complete dependence on foreign technology or equipment may create new vulnerabilities in the long term. Therefore, although achieving full self-sufficiency in defense industries is not feasible for many countries, the development of indigenous capabilities in areas such as design, repair, maintenance, equipment upgrading, and the production of certain key technologies can enhance the country's decision-making autonomy and defense flexibility.

Ultimately, the most important strategic lesson for Afghanistan is that the future of security competition will increasingly be shaped by knowledge, innovation, flexibility, and the speed of adaptation. Therefore, any defense policy that fails to incorporate these components into its long-term planning is likely to face serious challenges in responding to the rapidly changing security environment.

## CONCLUSION

Recent developments indicate that contemporary warfare has entered a new phase—one in which smart and low-cost technologies, such as drones, artificial intelligence, and dual-use technologies, have not only introduced new instruments into the battlefield but have also transformed the ways in which military power is produced and applied. This trend has made capabilities that were once largely exclusive to major powers accessible to a wider range of actors, although the superiority of great powers remains intact. Today, military success depends less on the mere accumulation of



equipment and more on innovation, organization, and the effective management of resources.

This transformation has also redefined the economic logic of war, turning indicators such as cost-effectiveness, speed of replacement, and flexibility into central measures of power. Smart technologies complement advanced weapons and are reshaping future military calculations. Future military competition will increasingly be a competition among defense innovation systems. States that can establish coherent linkages among research, technology, industry, and defense policy will possess greater capacity to adapt to emerging threats.

Accordingly, the most important finding of this study is that the fundamental transformation of contemporary warfare lies not in the end of the military superiority of major powers, but in the redefinition of the sources and mechanisms through which military power is generated. Within this framework, human capital, innovation capacity, technological infrastructure, organizational flexibility, and the ability to utilize smart technologies—alongside conventional warfighting capabilities—have become core pillars of defense power in the twenty-first century.

Therefore, the future of national security will depend more than ever on the ability of states to transform knowledge into technology, technology into defense capability, and defense capability into strategic advantage. The more effectively this cycle functions, the greater the capacity of states to maintain deterrence, strengthen resilience, and protect national interests.

#### RECOMMENDATIONS

1. Low-cost and smart weapons have transformed the concepts of power and security. Therefore, security policies should be formulated in light of this transformation, with particular attention to emerging technologies such as drones, intelligence tools, and artificial intelligence.
2. In addition to addressing its security challenges, Afghanistan should increase investment in technical education, engineering sciences, and technological development, as the country's future will increasingly depend on knowledge and innovation.



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