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Lessons learned from a year of war in Ukraine: a Greek reading

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Summary

- The Russo-Ukrainian war is expected to have a transformative impact on the conduct of warfare worldwide in the years ahead.
- Pre-war assessments underestimated the battlefield impact of the Ukrainian national identity and the Ukrainian troops' resulting will to fight.
- Starlink satellites, drones and smartphones have empowered Ukrainian infantry units, providing them with instant information critical for combined operations with artillery.
- At sea, Russian warships proved vulnerable to missile attacks, due to ageing designs and systems. In the air, extensive ground-to-air defence systems have constrained the air forces of both sides.
- On land, the lack of well-trained infantry on both sides has affected their operational efficiency. On the Russian side, the lack of evolution in tank design has rendered crews and machines excessively vulnerable. The 'Big War' has stretched both combatants' ability to provision themselves with precision munitions.
- Greek decision-makers need to both evaluate and shape Turkish assessments of Greece's will to fight; extensive training and reorganisation is needed for Greece's military to utilise ISR and OSINT developments; obsolete weapon platforms need to be replaced; access to sufficient precision munitions has to be secured via procurement or international alliances; Greece's conscripts and reserves need to be better trained and equipped.

Introduction

Apart from being a human tragedy of immense proportions and a seismic geopolitical development, the Russo-Ukrainian war, a conflict between two modern, industrial nation-states, is also a transformative event for the conduct of warfare worldwide. Not since the 1973 Israeli-Arab Yom Kippur war has there been an interstate conflict of such size and technological complexity[1]. The Russo-Ukrainian war is expected to transform the way nation-states prepare for armed conflict in the decades to come, and specifically, how they: invest in their defence industrial base and international alliances to guarantee plentiful access to war materiel; generate and disseminate battlefield-relevant data to their units; train their soldiers for combat and prepare civilians and civilian infrastructure for war; choose the weapon systems they develop or acquire, given that resources are always limited; and so on.

… a hot incident initiated with limited aims in mind could well escalate into the sort of 'Big War' we have all been witnesses to in Ukraine.

The Russo-Ukrainian war is therefore particularly pertinent to Greece. The country has been confronting an increasingly assertive neighbour in recent years: Turkey, which has been boldly militarizing its foreign policy and has demonstrated on several occasions its willingness to engage in warfare to advance its aims. Historically, expert opinion has favoured a worst-case scenario involving the two countries in a limited conflict predominantly involving naval and air forces, which is rapidly contained by the intervention of external powers. However, there is no assurance at the current juncture, if there ever was, that this would be the case. Indeed, even the Imia crisis of 1996, which conformed to these expectations, was ultimately contained due to the strong exercise of agency by the Greek government at the time, which was determined that its domestic modernization / euro accession agenda would not be derailed. Simply put, another Greek leadership at the time could well have opted to follow Turkey to the hellish brink of war. At the same time, under a current leadership which is untethering itself from the western vocation of the Turkish Republic and increasingly in need ofdomestic legitimation, Turkey's leadership is increasingly conforming with the type of regime that could engage in a diversionary war. On top of that, the Russo-Ukrainian war has proven the truism yet again that everyone knows how to start a war, but nobody knows how to end one. Thus, a hot incident initiated with limited aims in mind could well escalate into the sort of 'Big War' we have all been witnesses to in Ukraine.

For this reason, it is simply a matter of essential prudence that Greek civilian and military decision-makers should learn as much as they can, and as fast as possible, from the lessons to be derived from the Russo-Ukrainian war. Such lessons are undoubtedly being learned, both formally and informally, within the Greek Armed Forces and Ministry of Defence. However, in a democratic polity such as ours, this exercise must also be conducted in public for at least two important reasons: First, a diversity of opinions and informed judgements must become available which is not constrained by institutional and bureaucratic interests. Second, Greek public discourse needs to be part of this process. Reflecting on the lessons to be learned from the Russo-Ukrainian war will, after all, recommend important changes in the way Greece trains and equips its Armed Forces. These changes will inevitably upset various status quo constituencies and place demands on scarce fiscal resources. To be adopted and implemented, such changes will therefore require the maximum support that influential opinion leaders and an adequately informed public can master.

[1] On the lessons learned by the US Armed Forces from the Yom Kippur war and other military conflicts, which would go on to influence its weapons development, operations and doctrine, see B.L. Sterling (2021), *Other People's wars: the US military and the challenge of learning from foreign conflicts*, Georgetown University Press.

This policy paper seeks to contribute to both these goals and is organised as follows: The first section addresses the reasons why intelligent assessments privileged war within the Russian Federation leadership. The second section looks at how the Russo-Ukrainian war has transformed battlefield intelligence, surveillance and reconnaissance (ISR) up to and including the utilisation of open-source intelligence (OSINT). The third section will highlight those prime features of the Russo-Ukrainian war at sea and in the air which have been less prominent than expected. The fourth section will look at the land war. The fifth and concluding section will arrive at some provisional findings, on the basis of the preceding sections, with regard to the implications of the Russo-Ukrainian war for Greek national defence.

This policy paper is based, first, on reportage generated by English-language press media, and predominantly by the main US and UK news outlets which can afford to field reporters on the front line. Extensive use has also been made of reports generated by leading think tanks with a long-standing focus on defence matters, again from the UK and US in the main. Analyses of specialist defence-oriented publications have also been utilised, along with statements and speeches by leading Western military officers, both active and retired. No doubt, the findings presented in this brief review will be massively enriched in the months and years ahead, and in some cases revised and qualified, given that some of the preliminary analysis that has seen the light of the day will certainly have been affected by the combatants' need to slant information and inflate claims in their favour. Still, the author hopes that these pages contain enough to help provide both the engaged professional with additional perspectives and information and the general but engaged reader with insights into what this massive conflict means for Greece and its armed forces.

Russia's overwhelming superiority in manpower and materiel was perceived as the decisive factor.

Intelligence Assessment

From the very beginning of the Russo-Ukrainian war, major intelligence and/or analytical community failures have been identified and pored over. There have been three such failures to date: The first was a serious underestimation of Ukraine's will and ability to resist the Russian onslaught. The second failure was a serious overestimation of Russia's ability to successfully carry out an attack on Ukraine and thus overwhelm Ukrainian resistance. The third was the failure to properly understand the political drivers of Russia's attack on Ukraine and to predict the extent to which additional political factors would undermine the execution of Russia's aims in Ukraine, due to their impact on the battlefield effectiveness of the Russian Armed Forces.

The consensus assessment, for which US intelligence agencies and professionals have been criticized during Congressional hearings, was that Ukrainian forces would succumb after a period of weeks rather than months.

A variety of reasons have been offered for this US intelligence failure[2]. Thus, it has been noted that US analysts share a background in researching the USSR which, following the breakup of the Soviet Union, has led to an under-examination of the dynamics of its successor states, Ukraine included. Additionally, the US Department of Defence may have been too material-centric in its analysis, reluctant to assign due importance to intangible parameters such as the will to fight, which are difficult to evaluate yet alone predict in the cauldron of war. Instead, Russia's overwhelming superiority in manpower and materiel was perceived as the decisive factor. It is also possible that scholars belonging

[2] For an overview discussion, see Christopher Dougherty, Strange Debacle: Misadventures in assessing Russian military power, *War on the Rocks*, 06.16.2022.

predominantly to the Realist school, and arguing for the need to acknowledge Russia's geopolitical interests, assigned undue significance to factors such as corruption in Ukraine, which in retrospect proved to be of only marginal importance in the collective fight for national survival[3]. Last but not least, since the Ukrainian will to fight was underestimated, so was the impact this would have on the capacity to fight, on the rigours of training, on how troops are deployed on the battlefield, and on the quality of the relationship between the country's civilian and military leaderships[4].

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While these interpretations are tentative, there is greater certainty about what led Russian decision-makers to underestimate Ukraine's will to fight. Russian decision-makers and analysts themselves were dismissive of Ukraine's willingness and ability to defend their country. Despite a strong Russian intelligence presence (Federal Security Service—FSB) in the country and extensive ties through family, business and social relations, and the commonality, to a very large degree, of the Russian language, Russian decision-makers failed to understand Ukraine. Starting with the President of the Russian Federation himself, Ukraine's national identity was dismissed as an artificial construct. Such a dismissal of Ukrainian national identity was central to the belief held by the Russian elite and public that the post-Soviet order diminished Russian greatness. The West was also seen as having failed to heed legitimate Russian concerns about its security and need to be surrounded by dependent states. Ukraine's democratization, no matter how faulty, was also perceived as a threat to Russian ruling elites, since it offered a political orderin competition with the prevailing authoritarianism of the Russian Federation. Such beliefs and sentiments made it impossible for the intelligence services, and the FSB in particular, to speak 'truth to power' by producing analysis that argued that Ukraine national identity was strong and could possibly have a material impact on any future battlefield engagement[5].

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The end result of this failure to take this component into account is a renewed interest in, and emphasis on, analysis of the will to fight, in which area RAND, the US Air Force think tank, has produced seminal work. Indicatively, one of the analysts who led this effort identified the following as critical components of the Ukrainian Armed Forces' will to fight: desperation due to the existential nature of the war, national identity, societal support and effective messaging which helped engender international support[6].

Moving to the underestimation of the battlefield effectiveness of the Russian Armed Forces, the key criticisms that have emerged on pre-war assessments focus first and foremost on the failure to anticipate how support systems not properly attended to would undermine nominal numerical strength in weapons such as armour, aircraft and ships. Such support systems include the proper maintenance of weapons systems, effective logistics, high-quality training and the composition of the force. In particular, corruption, whose extent is difficult to gauge in peacetime, has been judged to detract from both the quality and quantity of provisioning in the Russian Federation Armed Forces, impacting on everything from first aid kits to the reliability of communication systems[7].

[3] On the analytical limitations of the US Realist school of thought, see R. Douthat, They predicted this war: but did they still get it wrong?, *New York Times*, 04.12.2022.
[4]Numerous accounts have noted the eagerness, and thus efficiency, with which Ukrainian troops receive Western training. See, indicatively, L. Seligman, 'Absolutely a quick study': Ukrainians master Patriot system faster than expected, *Politico*, 03.21.2023
[5] For an analysis on how these Russian elite and mass biases played out, see G. Miller and C. Belton, Russia's spies misread Ukraine and misled Kremlin as war loomed, *Washington Post*, 08.19.2022.
[6] See J. Cheatham, Intelligence and Intangibles: How to assess a state's will to fight, *Modern War Institute*, 07.27.22; J. E. Barnes, How U.S. agencies read two countries wrong, *New York Times*, 03.24.2022; and B. Connable, Ukrainian and Russian will to fight: An early-war assessment, *Atlantic Council*, 03.4.2022.
[7] See T. Kuzio, How Western Experts got the Ukraine War so Wrong, *Geopolitical Monitor*, 11.24.2022

Failure to account for the decisive impact of the political considerations driving the Russian Federation's decision to opt for war has been a decisive factor in the West's intelligence failure regarding both the ambition underlying the military campaign itself and the way it was executed.

What had US analysts gasping in disbelief was the decision taken by Russia's civilian leadership to adopt a battle plan that ignored key precepts of its own Armed Forces doctrine.

Non-front-line European decision-makers and intelligence analysts (most prominently in the case of Germany, but also in France, yet excepting the UK, which was privy to a much greater level of US intelligence), did not believe the Russian leadership would undertake an action that seemed irrational to them, meaning that its costs outweighed any potential benefits.i. Germany's investment in mutual dependency, informed morally by WWII and materially by German manufacturing's need to source cheap energy, must have been a factor in this inability to contemplate an outcome that would turn this twin commitment on its head. It is safe to say that, just a little more than a year ago, no leading German decision-maker or analyst was both willing and able to predict that German Leopard tanks would be prepared for export to the killing fields of Ukraine, or that Russian gas exports to Germany would have ceased[8].

Economically non-dependent on Russia and with fine-grained and multi-source intelligence on Russian decision-making, the US actually predicted that Russia would invade Ukraine. What had US analysts gasping in disbelief was the decision taken by Russia's civilian leadership to adopt a battle plan that ignored key precepts of its own Armed Forces doctrine by attacking a country the size of France on multiple fronts (as opposed to one main one with the possibility of an additional diversionary effort) with undermanned army units (as opposed to fully manned ones) and without first softening up opposition with an extensive air force and missile attack[9]. Since then, this failure has been ascribed to the Russian leadership's conviction that Ukrainians would not fight in any meaningful way for their country, and offer only token resistance that would be easily swept away by the Russian forces. This expectation was coupled with, first, a reluctance to shoulder the costs of extensive post-war reconstruction, generated by a massively destructive air campaign. And second, by the symbolic dissonance of attacking civilian targets, and by extension a people that were not only assumed to be, but also portrayed as being, brothers of the Russia people. Both these factors ended up constraining the way in which the Russian leadership chose to prosecute the war, particularly in its early phases.

The key fact of the Russo-Ukrainian war is the massification of the Intelligence function as a result of technological developments.

Intelligence, Surveillance, Reconnaissance (ISR), Open Source Intelligence (OSINT)

The key fact of the Russo-Ukrainian war is the massification of the Intelligence function as a result of technological developments which have been actively instrumentalised due to the exigencies of combat.

On the field, this has happened via three main technological media, often in interaction with each other in the case of the Ukrainian Armed Forces: Starlink satellites, smartphones and drones. The Starling satellites, provided by the American commercial aerospace company SpaceX, have allowed front line units to have access to data and imagery that would previously have been the exclusive domain of headquarter divisions and the political leadership. Starlink satellites have also created a vital redundancy in communications, replacing state systems that were damaged by cyber-attacks and thus

[8] See S. Harris, K. DeYoung, I. Khurshudyan, A. Parker and L. Sly, Road to war: U.S. struggled to convince allies, and Zelensky, of risk of invasion, *Washington Post*, 08.16.2022.
[9] See Dara Massicot (March/April 2023), What Russia got wrong, *Foreign Affairs*.

guaranteeing uninterrupted military and civilian communication[10]. Smartphones, in the hands of both soldiers and civilians, have generated masses of data, most prominently geolocated imagery of enemy units[11]. Drones, more often than not cheap commercial models, have allowed units as small as infantry squads to also locate enemy formations[12]. On the field, on their own and combined, these instruments have effectively shortened the kill chain of identifying the target, engaging with it and assessing the damage inflicted on it.

Off the field, high-resolution commercial satellite imagery and social media output has allowed both intelligence gathering agencies and civilian organisations and volunteers to identify actionable information on enemy formations and their movements, as well as to engage in battlefield assessments[13].

…infantry units and/or civilians have been quick to relay information to artillery units which can in turn direct their fire at enemy formations.

The advantages of this massification have been manifold[14]. We shall look at three: First, the increasing potency of combined arms as infantry units and/or civilians have been quick to relay information to artillery units which can in turn direct their fire at enemy formations. Second, greater force flexibility, as commanders at lower levels have access to information, including assessments of the battle damage sustained by the enemy, that allows them to evolve their tactics; this reinforces a mission command culture, whereby troops and their leaders are entrusted with an objective but not burdened with excessively rigid instructions, which may be rendered unrealistic during the flow of battle, on how to achieve it. Third, a premium on agility and superior field craft: since positions can easily be identified and rendered vulnerable, both effective unit concealment and rapid unit movements becoming a necessity.

In a virtuous circle, state-driven digitisation created digitally-minded citizens in peace time and soldiers and civilians adept at employing digital means for battlefield purposes in wartime.

In partnership with civilian institutions and individuals, Ukraine's armed forces have proven better suited and prepared to take advantage of these developments for reasons intrinsic to the war they have been fighting and the society and polity they had become prior to the onset of the war. The accelerating digitisation Zelensky championed during his pre-war presidency as a way of empowering citizens and rendering the state more responsive and open to citizen scrutiny led to the development of apps which facilitate bureaucratic accountability. These apps were quickly reconfigured to report battlefield developments through newly created military channels which could receive *inter alia* google map locations and screen shots. In a virtuous circle, state-driven digitisation created digitally-minded citizens in peace time and soldiers and civilians adept at employing digital means for battlefield purposes in wartime.

Western training, which had been ongoing for a decade prior to the outbreak of war, had instilled notions of initiative at the tactical level, along with a willingness and ability to act upon the information thus generated—in the Ukrainian special forces, if not in the core army formations, upon which the Soviet training of the older officer corps stills weighs heavily. Since Russia was the invading force, Ukrainian civilians could and did report the

[10] On the significance of the Starlink satellite system, see The Economist, Internet from the sky – The success of Starlink has ignited a new space race, 01.7.2023 and The Economist, Briefing Starlink - The satellites that saved Ukraine, 01.7.2023.
[11] On the use of smartphones on the battlefield, see K. Stastna, The smartphone war: Soldiers, civilians and satellites give the world a window on the Russian invasion, *CBC News*, 04.6.2022.
[12] On the function of drones in ISR, see J. Haltiwanger, Ukraine's battlefields look like World War I but with a new and terrifying addition that leaves troops with almost nowhere to hide, *Business Insider*, 01.23.2023; and Z. Kalleborn, From electronic warfare to cyber and beyond: how drones intersect with the information environment on the battlefield, *Modern War Institute*, 04.27.2022.
[13] On the multiplicity of actors generating OSINT information, see The Economist, Open-Source Intelligence – An open book, 01.21.2023; S. Feldstein, Disentangling the digital battlefield: how the internet has changed war, *War on the Rocks*, 12.7.2022; Z.T. Brown, Intelligence isn't just for commanders anymore, *Cipherbrief*, 02.26.2022.
[14] For an account on how Ukrainian forces have made use of this information environment, see T. Judah, Smartphones play vital role in defence of Kyiv, *Financial Times*, 04.11.2022.

enemy's formations and movements via smartphone applications. Last but not least, support for the Ukrainian cause in the West has meant that a critical mass of third-country expertise has been put at the service of the Ukrainian cause by cohorts such as armed forces veterans and the academic community who have undertaken at their own volition to identify, process and analyse open-source data. Ukraine's democratic polity has also created a domestic environment which, even in wartime, have proved conducive and receptive to the transmission of information, and related advice, from abroad[15].

There are two additional assumptions we can make. First Ukraine's status as a democratic polity, albeit an imperfect one, has facilitated the requisite collaboration, particularly between the Ministry of Defence (MoD) and the Ministry of Digital Transformation (MoDT)[16]. Interviews with the civilian leadership of the MoDT have demonstrated their ownership of the war effort and their confidence in the vital contributions that they and their Ministry are making to its successful prosecution. This ownership is demonstrated most critically in the MoTD's understanding of the criticality of the Starlink facility, the initiative to court Elon Musk personally to provide Starling services, the procurement of satellite dishes and so on. Second, collaboration between the Ukrainian military and civilian leadership and US military staff must have further enhanced the fusion of intelligence—its contextualization and use—generated by diverse information streams, both overt and covert.

… strengthen the central capacity to verify, synthesize and contextualize the masses of information generated at the tactical level and through OSINT.

The consequences of this synthesis of technology, operational culture and societal and polity features have been manifold and material for the Ukrainian cause. We mentioned the primary benefit above: namely, enhanced battlefield effectiveness. To this, we can add the sustainment of uniformed and civilian morale through the regular dissemination of imagery that: a) demonstrates the potency of the defenders and the defeats they have visited on the attackers; b) reveals wartime atrocities, enhancing vital international support for the Ukrainian cause at both the elite and mass levels; and c) commensurately undermine Russian claims with regard to battlefield outcomes or wartime atrocities[17].

In effect, while Ukraine has taken advantages of key attributes of its western partners, and the US in particular—Army training emphasizing initiative, highly advanced civilian technologies with compelling military applications, information at the fingertips of the consumer + citizen + soldier—it has also raised the operational and technological bar for its Western supporters. The key challenges identified to date as lessons advanced western armed forces can learn from the Russo-Ukrainian war in terms of ISR and OSINT are the need to: a) strengthen the central capacity to verify, synthesize and contextualize the masses of information generated at the tactical level and through OSINT, lest the fog of war migrates from the field to the decision-making centres and headquarter information systems; b) greatly expand access to what was previously privileged information available to only the very top of the various intelligence gathering and analysis hierarchies, so that many more actors can access information relevant to their mission within an intelligence apparatus; c) complement OSINT's unique advantage in detecting enemy capabilities with in-house expertise in assessing enemy intent, backed up by covertly collected information;

[15] For the uses to which Ukrainian governmental actors have made of outside intelligence, official and unofficial, see N. S. Abdala, P.H.J. Davies, K. Gustafson, D. Lomas and S. Wagner, Intelligence and the war in Ukraine: part 2, *War on the Rocks*, 05.19.2022.
[16] On the interaction between the Ukrainian MoD and MoDG, see G. Tett, The open-source war, *Financial Times*, 07.23-24.2022; and E. Labbot, 'We are the first in the world to Introduce this new warfare': Ukraine's digital battle against Russia, *Politico*, 8.2022.
[17] See, P.W. Singer, How Ukraine won the #Likewar, *Politico,* 03.12.2022; and S. Stolton and V. Jack, Ukraine wages 'information insurgency' to keep Russia off balance, *Politico*, 03.1.2022.

d) build the skills base at both the tactical and central level to ensure these diverse streams of information are used to best effect[18].

The Naval and Air Wars

That being said, Ukraine's ability to field cheap but effective USVs at short order was not taken into account by Western manufacturers of high-end warships who now need to develop effective countermeasures.

While the war has been dominated by developments on the ground, this is not to say that the naval and air war have been inconsequential.

In the naval domain, the two salient elements have been: a) the lack of a Ukrainian navy and the way Ukrainian forces have attempted to make up for this absence by attacking the Russian fleet from the land, sea and air.

The seminal sinking of the flagship of the Russian Black Sea fleet, the "Moskva", included a successful launch of a land-to-sea missile, a Ukrainian-made Neptune, in combination with a UAV presence, most probably a Bayraktar 2, to distract the flagship's defences. This operation underlined truths established as far back as the Falklands war and the sinking of HMS "Sheffield" by an Exocet anti-ship missile launched by Argentinian aircraft. This proved that large surface combatants need to be in peak form—as far as their systems and training are concerned—to provide effective antimissile defence and, failing that, to provide effective battle damage control. The "Moskva" is believed to have fallen short on all these counts, with fatal consequences. Its antiquated anti-missile systems and its construction, with its missiles on deck, made a missile hit both more probable and more devastating. Additionally, it has been speculated that its mixed crew of professionals and indifferently trained conscripts made its damage control less effective that it could have been. The use of the UAV may also have been helpful in the provision of a distraction, and we should expect UAVs to further complicate the defender's task in the future[19].

The attack on Russian warships in port by Ukrainian unmanned surface vehicles (USVs) was also noteworthy; contained damage was probably inflicted, but USVs are seen as incremental rather than transformative in their effects, with surface ships ultimately capable of developing effective countermeasures. That being said, Ukraine's ability to field cheap but effective USVs at short order was not taken into account by Western manufacturers of high-end warships who now need to develop effective countermeasures[20]. Finally, the ability of the Ukrainian forces to repurpose ground-to-ground missiles to attack Russian ships in port has been noted[21].

All in all, Ukrainian forces are judged to have played a weak hand well: eliminating the "Moskva" took its missile stock and command and control function out of the equation, compelling the Russian Federation's Black Sea Fleet to move further away from the shore, rendering less effective its role in supporting ground operations.

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[18] For a discussion on the lessons learned by western armies in the ISR and OSINT domains, see indicatively A. Janjeva, A. Harris and J. Byrne (June, 2022), The Future of Open Source Intelligence for UK National Security, Occasional Paper, *Royal United Services Institute*; General Hockenhull, Commander Strategic Command, How open-source intelligence has shaped the Russia-Ukraine war, *gov.uk*, 12.9.2022, M. Smith and N. Starck, Open-source data is everywhere – except the army's concept of information advantage, *Modern War Institute*, 05.24.2022 and T. Traylor and D. Nass, From Bombs to Bits: air-to-ground operations as a model for the tactical information environment, *War on the Rocks*, 03.25.2022

[19] For a discussion of the sinking of Moskva see, J. Stavridis, Russia's sunken warship is a warning to all navies, *Bloomberg*, 04.19.2022 and S. Wills, 40 years of missile warfare: what the losses of HMS Sheffield and RFS Moskva tell us about war at sea, 06.29 2022.

[20] For an account of this issue, see The Economist, Ukrainian ingenuity is ushering in a new form of warfare at sea, 12.7.2022.

[21] For the way Ukraine has engaged the Russian Navy by various means, see S. Kaushal, Ukraine's Uncrewed Raid on Sevastopol and the future of war at sea, Commentary, *Royal United Services Institute*, 02.2.2023; N. Childs, Ukraine: unconventional war at sea?, IISS, 11.11.2022; D. Sabbagh, Could Ukraine's drone attack on Russian ships herald a new type of warfare?, *The Guardian*, 11.1.2022.

The story in the air has been considerably more complex.

… due to the Russian leadership's assumption that Ukrainian resistance would rapidly collapse, the Russian Air Force did not undertake a massive weeks-long campaign prior to the invasion.

While the Russian Air Force has enjoyed dominance throughout, it has not been able to eliminate either the considerably smaller and less modern Ukrainian Air Force nor to eliminate the threat from Ukraine's ground-to-air defence[22].

Key weaknesses highlighted in the Russian Air Force include: limited training of aircrew in complex operations; limited airborne early warning and control system (AWACS) ability and no air-refuelling capability, which has limited both command and control operations in the air and the time in which such operations can take place; limited availability of precision-guided munitions; ineffective Suppression of Enemy Air Defences (SEAD) capability; lack of effective deconfliction, which has placed large swaths of the active front out of bounds to the Russian Air Force, for fear of friendly fire losses; delays in remitting target identification to aircraft crews has compromised the efficacy of the targeting process[23].

As mentioned above, due to the Russian leadership's assumption that Ukrainian resistance would rapidly collapse, the Russian Air Force did not undertake a massive weeks-long campaign prior to the invasion[24]. Together with the advanced warning the Ukrainian leadership received from US policy makers on the imminence of the Russian invasion, which allowed aircraft and ground-to-air systems to be dispersed, this meant that a critical mass of Ukraine's air defence systems survived to fight another day.

As Russian ground forces met effective resistance, the Russian Air Force was called upon to provide air support. However, the survival of Ukraine's ground-to-air missile systems resulted in significant losses of aircraft, forcing the Russian Air Force to provide air support at very low levels. However, this choice, compounded by the scarcity of precision-guided munitions (PGMs), rendered Russian aircraft vulnerable to man-portable air defence systems (MANPADs), such as Stingers, with which the Ukrainian troops were generously provided. Low-level night operations mitigated this threat somewhat, due to the lack of night vision equipment among Ukrainian MANPAD operators. These missions were constrained, however, by the limited type and number of Russian aircraft that are capable of undertaking night-time operations of this sort[25]. Subsequently, Russian aircraft avoided providing close air support, which would prove a critical factor in a series of victories which Ukrainian ground troops were able to win. Russian Federation ground- and sea-launched cruise missiles increasingly took the baton in terms of aerial attacks, primarily against Ukrainian stationary targets; attacks on fuel depots, railway junctions, energy, communication and other vital infrastructures sought to undermine government coordination, weaken Ukrainian popular will and deny the Ukrainian war effort key resources and materiel. However, this shift in strategy was blunted by successful interceptions by Ukrainian ground-to-air missiles, repairs, the dispersal of key activities, and the quantitative limitations of the Russian arsenal, as evidenced by Russian Federation forces using anti-ship or ground-to-air missiles for these attacks on ground targets.

The next iteration of the air war saw the extensive use of Iranian-made suicide drones which although much more easily intercepted, forced Ukrainian air defences to expend

[22] For an overview of the way the Russian Air Force has conducted itself, see J. Bronk with N. Reynolds and J. Watling, The Russian air war and Ukrainian requirements for air defence, Special Report, *Royal United Services Institute*, 11.7.2022.
[23] On these limitations, see J. Bronk, The Mysterious case of the Missing Russian Air Force, Commentary, *Royal United Services Institute*, 02.28.2022; and J. Bronk, Why Russia failed to dominate the skies over Ukraine, *The Spectator*, 09.18.2022.
[24] M. Pietrucha, Amateur Hour Part II: Failing the air campaign, *War on the Rocks*, 08.11.2022
[25] For an analysis of this phase of the air war, see, J. Bronk, Ukraine needs air defense assistance to protect hard-won victories on the ground, *War on the Rocks*, 11.16.2022.

precious ground-to-air missile munitions. The German antiaircraft armoured vehicle Gerard, which employs Oerlikon guns proved to be an effective match both in terms of accuracy and because it relies on less scarce bullets and not anti-air missiles. Yet Ukrainian forces did not possess nearly enough of these weapon systems to avoid depleting their more scarce ground-to-air missile stocks.

…long distance air-to-air missiles and the S400 anti-aircraft system, both of which were deployed outside Ukraine's territory, proved very hard to evade for Ukrainian aircraft.

On the positive side for the Russian effort, long distance air-to-air missiles and the S400 anti-aircraft system, both of which were deployed outside Ukraine's territory, proved very hard to evade for Ukrainian aircraft, resulting either in aircraft downings or the effective disruption of missions. Thus, the ability of the remaining Ukrainian air fleet to provide air support to their ground troops declined further. On the negative side for the Russian Federation, the extensive use of MANPADs by Ukrainian ground troops resulted in the loss of many Russian helicopter gunships, with the remainder forced to fire off their rockets from a distance and thus achieve a negligible impact on the enemy. Superior aiming technology and stronger armour plating may have mitigated this threat to the Russian Federation's attack helicopters, but their overall performance is bound to revive the debate on the survivability of helicopters in a peer to peer fight.

The Land War

The first undisputable key fact to emerge after more than a year of 'Big War' was that neither Russia nor Ukraine had developed manpower management systems that suited their forces in terms of quantity and quality combinations.

Russian infantry fighting vehicles (IFVs) carried no or very little dismounted infantry on them who could cover their tanks' flanks and suppress Ukrainian anti-tank teams.

This failure first became evident at the onset of the war in Russia's main army formation, the battalion tactical group (BTG): there was a lack of mechanized infantry[26]. This scarcity rendered Russian tanks vulnerable to Ukrainian anti-tank infantry. Russian infantry fighting vehicles (IFVs) carried no or very little dismounted infantry on them who could cover their tanks' flanks and suppress Ukrainian anti-tank teams[27]. Later, when the Russian leadership decided to order a partial mobilisation of reservists, it was revealed that these reservists had received no prior refresher courses, had not been properly trained ahead of their battlefield deployment, and were ill-equipped, from the type of body armour they were issued to their sleeping bags, and from the quality of their personal weapons and/or IVFs and the tanks they manned.

The Russian Federation's failure to field an adequately manned and trained force is partly due to fiscal constraints. The transition to professionalization was only partial as the state could not afford a level of compensation that would attract sufficient numbers to the Armed Forces. Additionally, the conscript complement, around half of the Army, was excluded from participating in expeditionary operations for political reasons, and was thus trained, and badly at that, for ancillary activities. As per the taxonomy of authoritarian state and manpower management systems, conscription in Russia was deeply unpopular due to extensive hazing and to the mundane tasks, devoid of skill and responsibility, allotted to conscripts. Last but not least, there were no resources invested in maintaining and upgrading the quality of professional and conscript reserves through refresher courses

[26] For a discussion of the main weaknesses in the Russian Army's force structure and manning in particular, see N.J. Fiore (2017), Defeating the Russian Battalion Tactical Group, *Armour Mounted Maneuver Journal*, pp.9-17; D. Axe, In Ukraine, Russian tanks are fighting without the protection of the infantry, *Forbes*, 03.15.2022; A.C. Fox (September, 2022), Reflections on Russia's 2022 Invasion of Ukraine: Combined Arms Warfare, the Battalion Tactical Group and Wars in a Fishbowl, Land Warfare Paper 149, *The Association of the United States Army*; and M. Kofman and R. Lee, Not built for purpose: the Russian military's ill-fated force design, *War in the Rocks*, 06.2.2022.

[27] See S. Cranny-Evans, How anti-tank weapons shaped the early phase of the Ukraine war, *Army Technology*, 06.27.2022; and H. Foy and I. Bott, Ambush tactics and compact weapons expose invaders' military weaknesses, *Financial Times*, 03.17.2022.

and participation in training exercises. Illuminatingly, prior to the war breaking out, the functional reserves of the Russian Federation Army was a tiny cohort numbering just 5,000 troops.

An additional factor related to the above which compounded Russian battlefield failure has been the rigid command and control culture which permeates the Russian Armed Forces.

An additional factor related to the above which compounded Russian battlefield failure has been the rigid command and control culture which permeates the Russian Armed Forces. This has meant that deployed units, being both unable and unwilling to adjust to the tactical situation at hand, would persist with existing orders at great cost in terms of casualties and equipment loss. Moreover, this lack of tactical initiative allowed their Ukrainian opponents to predict their modus operandi and position themselves accordingly. This rigidity has no doubt many causes, such as formulaic training which conditioned officers and made it impossible to convert professional soldiers into tactically imaginative NCOs, and undertrained conscripts who could only execute the simplest instructions. Exhibit A in this culture of command is the death of numerous high ranking Russian officers who were compelled to assume tactical leadership and thus become vulnerable to decapitation attacks by Ukrainian forces.

Continuing with institutional factors which affect battlefield performance, as mentioned above, corruption and negligence combined are seen as significant factors in undermining Russian fighting efficiency. Vehicle maintenance and repair has been notably deficient, resulting in the abandonment of a high volume of Russian vehicles. Insufficient fuel and other supplies, such as rations and first aid kits, have been attributed to pilfering as well as to corrupt procurement by personnel at all levels[28]. These institutional failings were compounded by a lack of logistical preparations in the early stage of the war, which stemmed from the mistaken assessment examined above that Ukrainian forces would quickly fold. Accounts therefore abound of vehicles of all sorts being abandoned for lack of fuel, or Russian soldiers foraging for food in the territories they occupied.

Ukraine's armed forces were compelled to overexpose their more experienced, professional troops, which excessively thinned their ranks.

In the case of Ukraine, non-professional territorial units were only legislated into existence two years prior to the war breaking out, despite the country being in armed conflict with Russia since 2014, while universal conscription in peacetime was not instituted. Consequently, as war made formidable demands on manpower, Ukraine was compelled to provide basic training, either in-country or in the UK and elsewhere, to civilians who had no prior exposure to army training. Such training has inevitably been compressed to just five weeks from the 3–4 months that is typical for conscripts. Ukraine's armed forces were compelled to overexpose their more experienced, professional troops, which excessively thinned their ranks and undermined their ability to use these elite cohorts as a lever to upgrade the field craft of the conscript inflows generated by the war[29].

In terms of battlefield innovation in equipment and operations, as expected the land war has proven catalytic both in exposing the weaknesses of fielded equipment and accelerating the introduction of new equipment and methods.

[28] On institutional weaknesses and fiscal constraints as factors in the Russian Federation's failure to adequately train and equip its mixed army, professional and conscript, see P. Beliakova, Russian military's corruption quagmire, *Politico*, 03.8.2022; M.N. Posard and K. Hokynska, Russia has a military professionalism problem and it is costing them in Ukraine, *Breaking Defense*, 03.21.2022; N. MacFarquhar, Russia planned a major military overhaul. Ukraine showed the result, *The New York Times*, 05.16.2022; K. Stepanenko, F. W. Kagan, B. Babcock-Lumish, Explainer of Russian Conscription, Reserve and Mobilisation, *Institute for the Study of War*, 03.5.2022; and L. Tcantouridze, Why Russia's military reforms failed in Ukraine, *The National Interest*, 10.15.2022.

[29] For a thorough analysis of the Ukrainian Army's strengths and weaknesses, including in the latter case the lack of universal conscript and reserves components well trained during peacetime, see M. Zabrodskyi, J. Watling, O. V. Danylyuk and N. Reynolds, Preliminary lessons in conventional warfighting from Russia's invasion of Ukraine: February-July 2022, *Royal United Services Institute*, 11.30.2022.

… we note the failure of Russian armour--as in the case of the T72, the mainstay of the Russian main battle tank fleet--to keep pace with pre-war developments in ground anti-tank munitions.

In relation to the former, we note the failure of Russian armour--as in the case of the T72, the mainstay of the Russian main battle tank fleet--to keep pace with pre-war developments in ground anti-tank munitions and either be substantially upgraded or replaced altogether. The absence of counter-measures introduced, together with the positioning of munitions under the tanks' personnel, has resulted in catastrophic losses of both tanks and crews. Clearly Russia's military & industrial complex, unlike that of Israel or the US, failed to assimilate feedback loops from the battlefield into R&D and subsequently deploy sufficiently upgraded armour. This weakness reflects badly on civil-military relations, the innovation dynamic of the Russian Armed Forces, and the aptitude to learn from other peoples' wars. It is also indicative of the limited nature of the prior engagements of the Russian Federation Armed Forces in conflicts such as Georgia and Syria[30].

On the positive side for the Ukrainian Armed Forces, it is expected that the provision of adequately protected IFVs with a strong anti-tank capability, such as German Marders and US Bradleys, will powerfully complement both their existing main battle tanks, mainly upgraded T72s, as well as the soon-to-be-delivered German Leopards. Thus, the ability of the Ukrainian Army to undertake an effective combined arms—armour and mechanized infantry—war of manoeuvre will soon be enhanced[31].

Smaller drones of this sort have been used in their thousands for reconnaissance purposes, situational awareness, attacks and target identification for artillery.

The most dramatic development, as mentioned above, has been the explosive growth in the organic use of unmanned aerial vehicles (UAVs) by ground troops, whether they be infantry or artillery[32]. Illuminatingly, a few months into the fighting, commercial quadrocopters like the commercial Chinese DJI drones had already replaced Turkey's BT2 Bayraktar as the iconic UAV type of this war. Smaller drones of this sort have been used in their thousands for reconnaissance purposes, situational awareness, attacks and target identification for artillery. In effect, a new specialty has been created, as in the case of the Ukrainian four-strong teams which deploy drones in combination with supporting Starlink satellite dishes. Russian and Ukrainian UAVs, such as the Russian medium-sized propeller driven Orion, have proven themselves on the battlefield, too, by both transmitting video footage that can direct artillery fire and detecting communications which can also enable target acquisition. Battlefield damage assessment has also been improved on both sides. Counter drone and UAS capabilities have been employed or developed. Russian Federation electronic warfare systems have been prominent in their ability to jam UAV-use by Ukrainian units, thus rendering them ineffective. The Ukrainian Armed Forces' counter-UAV response has been bedevilled by a lack of counter solutions such as short range air defence (SHORAD) weapon systems, at least in sufficient quantities, forcing them to expend instead difficult to replace MANPADs and other ground-to-air missiles.

[30] For an insightful analysis of this inability on the part of the Russian Army to innovate and thus protect its tank formations, see D. Johnson, The tank is dead: Long live the Javelin, the Switchblade, the….?, *War on the Rocks*, 04.18.2022.

[31] See H. Altman, This is what Bradley Fighting Vehicles will bring to the fight in Ukraine, *The War Zone*, 01.6.2023; F. Hoffman, Tanking up: understanding the materiel – and moral – implications of the new armor heading to Ukraine, *Modern War Institute*, 02.03.2023; and S. Vlassis, The new-type American-trained Ukrainian units and what the numbers show, *Doureios Ippos*, 01.18.2023 (Σάββας Βλάσσης, Οι μονάδες «νέου τύπου» των Ουκρανών που εκπαιδεύουν οι Αμερικανοί και τι δείχνουν οι αριθμοί).

[32] For a discussion of the evolution of the use of drones by both the Russian and Ukrainian forces, see indicatively Z. Kallenborn, Seven (initial) drone warfare lessons from Ukraine, *Modern War Institute*, 05.12.2022; I. Khurshudyan, M. Ilvushina and K. Khudov, Russia and Ukraine are fighting the first full-scale drone war, *Washington Post*, 12.2.2022; A. Lowther and M. K. Siddiki (Winter, 2022) Combat drones in Ukraine, *Air & Space Operations Review*, Vol, 1, No 4l; A. Kramer, From the workshop to the war: creative use of drones lifts Ukraine, *The New York Times*, 08.10.2022; S.G. Jones, J. Harrington, C.K. Reid, M. Strohmeyer (November 2022), Combined arms warfare and unmanned aircraft systems – a new era of strategic competition, *CSIS*.

In general, maintaining sufficient stocks of all munitions—artillery, MANPAD missiles, High Mobility Artillery Rocket Systems (HIMARS)—has become an issue for both combatants. Indicatively, it has been estimated that, were the UK artillery to be engaged with the same munitions to expense tempo as Ukraine's forces, its available stocks would run out in a week. Apparently, among Western European countries, only Finland is equipped to fight the type of artillery war that the Ukrainian Armed Forces have been fighting[33].

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Precision munitions, as in the case of HIMARs, have proven very effective both at hitting Russian munitions dumps and at enhancing the mobility of Ukrainian artillery fire, which is not tied to the difficult and time-consuming relocation of munitions supplies. Yet these high precision systems are the ones that exist in only limited quantity and are time-consuming to manufacture. Systems quantity, in terms of platforms and munitions, have been at a premium for another reason: as the 'Big War' increases in duration, Ukraine's ability to defend itself has come to depend, too, on its ability to provide ground-to-air defence of a wide variety of fixed installations spread across the country, which are critical for the war effort. Such facilities include fuel depots, training camps, defence manufacturing plants, energy plants, etc.

More generally, Ukraine has been absolutely dependent in both qualitative and quantitative terms on the provision of weapon systems by its Western allies, across the board and most clearly in the land war. As the smaller country with the weaker air force and air defence capability, its own substantial defence industry was vulnerable to Russian attacks, as noted above. As a result, its ability to provision itself with systems and materiel has been substantial, but not sufficient. Consequently, its growing reliance on external support has become a source of both strength and weakness: a source of strength, because Ukraine's Western allies, and principally the US, have been able to provide Ukraine with high-quality weapon systems, munitions and other ancillary materiel; a source of weakness, because these supplies have been subject to limitations imposed by the risk calculus of Ukraine's own allies, which relates to the Russian Federation's leading nuclear power status as well as perceptions of what constitutes an acceptable endgame for the Russo-Ukrainian conflict[34].

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Conclusions: A Greek Reading of Lessons Learned

On the subject of intelligence assessment, we will begin with the observation that it is critical to assess how Turkey's decision-makers, as well as the Turkish public, perceive Greece's deterrent abilities. Greek commentators often note that the Turkish Armed Forces have a healthy respect for the efficacy of Greek Armed Forces and their deterrence capability. We must also acknowledge, however, that the Turkish officer corps is not monolithic, and that significant factions could well sponsor, for reasons of personal ambition, ideology and inter-service competition, a highly aggressive stance towards Greece premised on their perceived superiority of Turkish over Greek arms. Even more consequentially, regime characteristics, such as the personalistic rule of President Erdoğan and his choice to instrumentalise military aggression for domestic purposes, may well inject Turkish decision-making with a bias in favour of challenging Greece militarily. In this context, Turkish readings of past conflict encounters, as in the case of the Cyprus invasion

[33] On the vast quantities of all types of munitions and their effect on the battlefield, see indicatively M. Champion and A. Kudrytski, Ukraine's forces get boost from arsenal of old-fashioned artillery, *Bloomberg*, 04.28.2022; M. Jacobson, What artillery and air defense does Ukraine need now?, *War on the Rocks*, 04.15.2022; M.W. Bishop, 'They're wiping us from the earth': Evading Russian artillery with a Ukrainian military unit, *Rolling Stone*, 06.12.2022.

[34] See, indicatively, for an analysis and discussion of this issue, The Economist, Ukraine's coming counteroffensive – Lock and load, 03.11.2023; and N. Schandlow, Incrementalism is throttling U.S. support for Ukraine, *Foreign Policy*, 03.9.2023.

of 1974 and the Imia crisis of 1996, may be shaped by the current Turkish regime's triumphalist self-aggrandisement and concomitant manipulation of public opinion; if Turkish elites and publics should come to consider a military clash between Greece and Turkey as a a foregone conclusion in Turkey;s favour, it could lead Turkey to initiate such a military incident. Such an incident could in turn escalate into a full-blown war between the two countries. Considering the determination of Greece's civilian leadership to make full use of the country's military power, to defend the country's sovereign territory and rights, one should not expect Turkey to get away with localised gains.

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Thus, Greek analysts and policy makers need to be able to assess Turkey's current perceptions of the credibility of Greece's deterrence. What also needs to be evaluated is whether Greece's ongoing efforts to strengthen its national defence are indeed sufficient to shape Turkish perceptions of Greece's ability and willingness to defend itself, and to such a degree that Turkey is persuaded to pursue the path of peaceful bilateral negotiation rather than the path of war. If not, Greece may need to undertake further measures, both in terms of substantively enhancing its national defence and, to the maximum degree possible, effectively communicating to Turkish elites and publics that Greece cannot be defeated. Such a demonstrable enhancement could take the form of extending conscription to, for instance, 16 months from the present 9–12 months and investing in parallel in the Hellenic Army's (HA) training and equipment. To make this point clear, let us entertain the counterfactual of Ukraine having instituted universal—and effective, in terms of equipment and training--conscription prior to the Russian invasion in February of 2022, from 2020. Such a measure could conceivably have compelled the Russian leadership to take the invasion option it ended up adopting off the table.

Greek policy makers and analysts also need to undertake a well-informed and frank assessment of the military strength of both Greece and Turkey which goes beyond nominal force structures.

Equally important, Greek analysts and policy makers need to communicate their assessment of Turkish perceptions of the credibility of Greece's deterrence, to the extent that such perceptions may tip the Turkish scales towards military conflict with Greece, to their key western allies and major EU member states. Particularly to those allies that may discount such an eventuality as 'unthinkable'.

Greek policy makers and analysts also need to undertake a well-informed and frank assessment of the military strength of both Greece and Turkey which goes beyond nominal force structures and evaluating intangibles and qualitative factors such as the will to fight. Special attention should be paid to those factors that can buttress Greece's advantages as a smaller-sized defender. Do Greeks in uniform, whether they be professionals, conscripts or reservists, possess such attributes as confidence in their leadership, training and equipment that are supportive of the critical will to fight parameter? Do long-standing governance issues[35] pertaining to Greece's national defence impact negatively on the Greek armed forces and to what extent? For instance, is there sufficient parliamentary, expert and media scrutiny of national defence funding and policy, considering the 'Big War' era we are living through? On the other hand, do Turkish forces, and primarily the conscript and reserve components, have a will to fight in a scenario of generalised war with Greece? And how have developments in civil and military relations in Turkey, particularly after the failed 2016 coup and the subsequent purges and coup-proofing strategies instigated by the Erdoğan regime, affected the battlefield effectiveness of the Turkish Armed Forces?

In terms of ISR and OSINT, we note that a number of policy initiatives and developments in Greece point towards the development of useful capabilities, similar to those fielded by Ukraine's Armed Forces. The recent acceleration of state-driven digitisation in Greece

[35] See, Government Defence Integrity Index (2020), Country Brief: Greece, *Transparency International Defence & Security*

both makes for a more digitally-capable nation and puts digital tools at citizens' disposal via the PC and the smartphone. The Ministry of Digital Governance (MDG) has taken note of the utility of low earth orbit (LOE) satellites, such as Starlink. A upgraded locally distributed civil defence operation facilitates citizen engagement and responsiveness to an emergency. Taking into account the lessons learned from the Russo-Ukrainian war, these and other strands now need to be pulled together into a coherent whole. There is definitely a need to put in place, in peacetime, a well-funded, inter-ministerial and cross-disciplinary effort explicitly designed to address the exigencies of the Armed Forces in case of war. Indicatively, this may range from the MDG accelerating its efforts to acquire dedicated LOE coverage for the creation of a drone specialty in the Armed Forces and to acquire hundreds if not thousands of drones to be deployed down to the infantry squad level. Finally, distributed and democratized intelligence requires an ambitious effort within the Ministry of Defence and the Armed Forces to efficiently amass the huge quantities of information generated by the modern battlefield; to ensure its effective distribution; to inculcate an information culture in the Armed Forces, and to train them to act upon this information in a timely manner and in a mission-command context.

In terms of ISR and OSINT, we note that a number of policy initiatives and developments in Greece point towards the development of useful capabilities, similar to those fielded by Ukraine's Armed Forces.

Turning to the naval war, we note how punishing the environment is to surface ships that have not upgraded and are thus vulnerable to anti-ship missiles. This is a pertinent issue for the Hellenic Navy (HN), which is still predominantly composed of ageing frigates and fast attack missile boats. While the ongoing procurement programme is meant to address this issue through the acquisition of latest-generation frigates and corvettes, fleet strength should be assessed in a brutally honest fashion so necessary upgrades can take place and/or surface ships can be retired and replaced by a greater number of new acquisitions. On the other hand, the Ukrainian forces' ability to inflict damage on the RF fleet by a variety of means—USVs, UAVs co-deployed with ground-to-ship missiles, and even using ground-to-ground missiles to attack ships--point the way to the Greek Armed Forces being similarly enterprising and committing resources to sea denial capabilities located in the Aegean island complex.

… fleet strength should be assessed in a brutally honest fashion.

In terms of the air war, the complex challenge faced by either one or both air forces in the Russo-Ukrainian war pose a number of questions for the Hellenic Air Force (HAF), which has a well-earned reputation for tactical excellence in air superiority missions, acquired over the Aegean and in decades of grey zone operations facing the Turkish Air Force. Does the HAF train intensively enough with the Hellenic Army (HA), and is it ready to play its part in combined operations in the event of all-out war with Turkey? Are precision munitions stocked in sufficient quantities for the HAF to achieve its complex mission in such a scenario, and if not, are the country's alliances such that they can make up the shortfall quickly? Is the HAF prepared to disperse to multiple sites, so that precious aircraft can be protected from a missile assault while on the ground?

While the HAF has surely been poring over the conflict, and the lessons learned process now percolating through NATO training will benefit the HAF's tactics and operations in due course, the larger question is a politico-military one: can an effective civil-military collaboration provide in due course the training, resources and doctrinal changes required to expand HAF competences beyond its demonstrably proven skill in grey zone operations? Given that a 'Big War' is now a distinct possibility in Europe, can its eventuality be deterred through adequate preparation? And, once in place, can an enhanced deterrence capability against a 'Big War' scenario with Turkey be effectively communicated to Turkish decision-makers?

Moving to the land war, the indisputable lesson for the HA is the need to train and equip a conscript component, in both active service and effectively mobilisable reserves, that

… the indisputable lesson for the HA is the need to train and equip a conscript component, in both active service and effectively mobilisable reserves, that can fuse seamlessly with professional NCOs and officers.

can fuse seamlessly with professional NCOs and officers. This need is particularly pertinent in the case of combined operations between tanks and mechanized infantry, where Greek vulnerabilities are not unlike those experienced by the Russian Federation BTGs; the Greek mechanized conscript-based infantry needs to have its training substantially upgraded and to be supplied with a critical mass of relatively modern IFVs, such as the German Marders, so that it can support the operations of the substantial Leopard fleet of Greek main battle tanks. Likewise, the conscript component needs to be better trained and equipped if it is to play the role the more experienced Ukrainian forces are playing in effectively degrading attacking RF armour through skilled small unit tactics and the employment of plentiful anti-tank missiles. The same applies for the ability of Greek infantry conscripts to provide effective anti-air fire, using MANPADS to attack helicopters or low-flying fixed wing aircraft. We include the HA's conscript special forces' component here, which is not as intensively trained as the professional special forces cohorts[36].

… there has been no announcement yet of the creation of a drone specialty in the HA, no mass acquisition of drones, and no integration of drones into training.

We note here, however, that the effective deployment of ground troops by Ukraine, a function both of their systematic training by mostly US and UK instructors at the Yaroviv training site, which involved Ukrainian special forces and other professional troops, soon reached its limitations. As mentioned above, the need to field conscripts who were not trained during peacetime meant that Ukraine effectively traded space for time to do during wartime what it should have been doing during peacetime: namely, producing battle-ready conscripts and reserves. Specifically, the Ukrainian Army, while defending the country's vast territory with professionals and under-trained territorial soldiers--and, when necessary, retreating from such territory--has been training troops conscripted for the very first time. Given Greece's far smaller size, that option simply does not exist.

The rudimentary training given to Greek conscripts and reserves means that the civilian and military leadership has not committed to their being adequately trained and equipped with tried and tested weapons systems and operational concepts—as mentioned above, in combined armour and mechanized infantry operations, or in antitank tactics; however, it also means that the HA has been slow to recognize and act on the promise of new technologies and operational concepts. This has been the case with the deployment of drones, which have proven their indispensability beyond any doubt to both combatants in the Russo-Ukrainian war. Thus, there has been no announcement yet of the creation of a drone specialty in the HA, no mass acquisition of drones, and no integration of drones into training and operations, whether in single service operations (i.e. infantry reconnaissance) or combined operations (e.g. infantry and artillery).

… the growth of the Greek defence industrial sector will be a necessary component in the country's deterrence in the months and years ahead.

The Greek Armed Forces are also at a comparative disadvantage to those of Turkey in a 'Big War' scenario, due to the robust growth of the Turkish defence industrial base, which would be able to provision and repair the Turkish Armed Forces' war materiel. Thus, the growth of the Greek defence industrial sector will be a necessary component in the country's deterrence in the months and years ahead. Considering that such a 'Big War' scenario would be tantamount to Turkey making a radical break from its Western orientation, Greece, like Ukraine, should work to maximize its advantage: its ability to source materiel from its Western partners in wartime. The ideal scenario here would be for Greece to meet the EU halfway in geopolitically-informed weapon systems R&D and procurement choices as a means of strengthening its deterrent capability in a 'Big War' scenario, extending its mutual defence agreement with France to the pan-EU level. Doing

[36] On the limitations of the current Greek conscript component, see A. Kamaras and N. Stournanas, Achieving Qualitative superiority – Greek conscription and the Turkish Threat, Policy Paper 93, *ELIAMEP*, 03.2.2022; *Doureios Ippos* (June-August 2019), Interview with a Greek in a foreign army - basic infantry training, (Δούρειος Ίππος, Συνέντευξη με έναν Έλληνα σε ξένο στρατό – Βασική Εκπαίδευση Πεζικού); and S. Vlassis (September-November 2022), Basic and advanced training of an enlistee, Hellenic Army and Professional Army, *Doureios Ippos* (Σάββας Βλάσσης, Βασική & Προκεχωρημένη Εκπαίδευση Νεοσυλλέκτου, Ελληνικός και Επαγγελματικός Στρατός, Δούρειος Ίππος).

so would mean Greece being granted access to the collective arsenal of the EU and its key member-countries, and thus being able to rapidly replenish its weapons platforms, munitions and components[37].

…the Greek civilian leadership has historically not committed sufficient attention and resources to the less visible, but indispensable, maintenance and follow-up support of the weapon systems they have decided to procure.

Finally, Greece's civilian leadership has historically been keen to match Turkey in terms of its main weapon systems, such as main battle tanks, fighter aircraft and battleships. The procurement of these big acquisition items convinces the Greek public of the potency of the Greek deterrence, constitutes a convincing deterrence message to Turkey, and cements the country's ties with its external security providers, such as the US and France. However this civilian prioritization often comes with baggage that undermines the battlefield effectiveness of the Greek Armed Forces. We will flag two main problems that have also manifested themselves on Ukraine's killing fields: First, the Greek civilian leadership has historically not committed sufficient attention and resources to the less visible, but indispensable, maintenance and follow-up support of the weapon systems they have decided to procure, with many of them rendered inoperable as a result[38]. Second, there is only a limited commitment on the part of the civilian leadership to those less visible and glamorous items, such as electronic warfare and communication systems, that are tremendously valuable in assuring that the units that are fielded can fulfil their battlefield role, both on their own and in combined arms operations, while simultaneously disrupting the enemy's ability to be battlefield effective.

[37] For a discussion of Greece's defence sector, its past travails and its promising future trajectory as a pillar of Greece's deterrence, see A. Kamaras, The Greek Defence Sector: Turning the page, Policy Paper 126, *ELIAMEP*, 02. 9.2023.

[38] A well-informed civilian and major benefactor to the HN points some of the problems bedevelling Greece's navy due to the inadequate operational and technical support, see P. Laskaridis, Immediate support of the Navy, *Kathimerini*, 27.11.2022 (Πάνος Λασκαρίδης, Άμεση ενίσχυση του Πολεμικού Ναυτικού, Καθημερινή). Lack of follow-on support has immobilized almost all of HAF's transport planes see, Onalert, C-130 and C27J, what is the situation in the fleet of the transport planes of the Air Force (C-130 και C-27J: Ποια η κατάσταση στον στόλο μεταγωγικών αεροσκαφών της Πολεμικής Αεροπορίας)