

Russian Military Logistics and the Ukraine Conflict: Analyzing Dynamics of Multilevel Alignment

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Abstract

On February 24, 2022, Ukraine faced a multiple front, Russian invasion. The invasion however, seemingly because of poor planning and the lack of logistic and sustainment capacity, failed to achieve the initial objectives. As war is inherently linked to uncertainty, attaining logistic objectives is challenging. Against this background, this chapter aims to understand the logistical rationale behind the Russian military operation and how it materialises from a strategic level to the tactical level. By using a multi-level framework to analyse the Russian operations, this study portrays that logistics therefore, like land operations, requires a comprehensive approach from the tactical to the strategic level. In short, we show the necessity and complexity of aligning operations to cope with hostility.

Keywords: Levels of logistics, Align operations, Comprehensive approach

1. Introduction¹

Russia invaded Ukraine on February 24th, 2022, on multiple fronts to establish Russian dominion in at least several provinces where separatist movements were sympathising with Russia and contesting Ukrainian government control. Given the apparent overwhelming imbalance in military size and capability between Ukraine and Russia, this operation was expected – both by Russian leadership and

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¹ This chapter was written using a Western lens on the conflict raging in Ukraine. The knowledge and assessments were made by western researchers by using western research and literature. We are aware of substantial differences between our socialisation and Russian perspectives. It is very well possible that the Russian way of (kinetic) warfare as we see it today is only a small part of a bigger Russian picture. In Western society using the M of DIME is a last resort whereas it might be just a minor tool in Russia's toolbox. Our focus on kinetic warfare distracts our attention from the other tools in the toolbox that may ultimately have a greater effect.

external observers – to last no more than a few weeks. However, the initial attack failed to achieve its stated objectives, in part because of poor planning and lack of capacity in logistics and sustainment.² Vivid imagery included the Russian convoy in the vicinity of Kyiv.³ Russian leadership seemed puzzled by the lack of success of the presumed quick and contained ‘special military operation,’⁴ and shifted to new fronts in the Ukraine’s south eastern provinces. How was this operational and logistics struggle possible? Why did the armed forces of the Russian federation not live up to their expectations? What went wrong? Understanding the operational-logistics challenges of Russia seems increasingly urgent.

Commonly, military logistics is considered a problem of supply chains, transportation, sourcing and technology/ asset management, often tied to specific operations.⁵ This approach lacks a strategic and systemic perspective on military logistics,⁶ with strategic including societal embeddedness in production structures.⁷ With prolonged and (near) peer wars like the present one in the Ukraine, new insights are required to contextualise military logistics,⁸ without ignoring its traditional role and conceptualisation.

In this chapter we therefore seek to understand the logistical rationale behind the Russian military operation and how it has logistically materialised across multiple levels. Our generalised objective is to enable systematic, multilevel analysis of a warfighting party’s logistics. We confined our study to Russian military logistics, rather than Western, NATO or Ukraine logistics. The latter forms of logistics tend to receive ample attention, while new insights into Russian military logistics clearly matter to Western policy makers and planners.

We adopt a multilevel framework common in business and military operational studies. Levels include strategic-operational-tactical (military version), which resembles strategic-tactical-operational levels in business studies. Within and across the levels, strategies, plans, resources, and activities are coordinated (‘aligned’). We transpose the multilevel framework towards military logistics,⁹ enabling zooming in and out of logistical processes of relevance to military operations.

² https://www.rand.org/pubs/research_reports/RRA2033-1.html.

³ Lister, Murphy, Mezzofiore, and Alkhaldi, “The 40-mile-long Russian convoy near Kyiv has moved. Here’s what it means for the Ukrainian capital.”

⁴ Martin and Maynes, “Putin justifies Ukraine invasion as a ‘special military operation.’”

⁵ Kress, *Operational Logistics: The Art and Science of Sustaining Military Operations*; Smith, *Defence Logistics*; Yoho, Rietjens, and Tatham, “Defence Logistics: An Important Research Field in Need of Researchers.”

⁶ <https://www.cfc.forces.gc.ca/259/290/24/192/Davis.pdf>; <https://open.spotify.com/episode/5YcDJr4GayA8yZpza8LopRc>

⁷ Rodnikov, “Logistics in command and mixed economies: The Russian experience.”

⁸ <https://rusi.org/explore-our-research/publications/commentary/ukraine-war-has-found-maa-chinery-western-governments-wanting>.

⁹ Note that our framework for military logistics differs from multilevel (aggregation-based) distribution; Smith, “The mandate to revolutionize military logistics.”

We try to find answers on how logistics and Russian land operations interrelate, interpreting logistics as a comprehensive phenomenon, from battlefield combat logistics up to strategic sustainability, including sourcing and production capacity. We gradually build towards the Ukraine case itself by (1) examining two historical cases on Russian logistics to verify the framework. (2) We then analyse the transformation of the Russian armed forces, with a focus on logistics, from the Soviet era to the present by looking again at the multilevel framework presenting the development of the strategic political vision and its derivative at the strategic military level. This is followed by a section in which we seek to improve our systematic understanding of Russia's warfare from a logistics lens, by analysing Russia's multilevel logistics in the Ukraine conflict. We finalise this chapter by discussing implications for military practice and research.

2. Connecting the levels of warfare: Towards a framework for systematic military logistics analysis

Modern day military theory divides warfare into three levels, strategic, operational and tactical,¹⁰ founded in the Napoleonic Wars, and formulated by the Prussians during the Franco-Prussian War. Subsequently, at the Frunze academy in Moscow,¹¹ it was thoroughly developed by the Soviets until the Russian Revolution.¹² It came to maturity as this three-level model after the Israel wars and Vietnam. These three levels are considered a generic framework to define, clarify and prescribe the correlation between national objectives, operational approach, and tactical tasks, involving political, civilian, and military actors. Simultaneously it provides clarity about the roles played by the distinct levels and thus in a way establishes a certain accountability relationship (Shunsaku, 2021).¹³

In a military sense, the levels clarify the role played by each level of command and headquarters and can be seen as the creation of strategy, the synchronisation and sequencing of battles and engagements. Simply stated, the strategic level is the field where political end states meet the military ends. At the operational level, these ends are translated into campaigns which lead to activities executed at the tactical level – making for complex cross-level dependencies across diverse communities of actors.

¹⁰ Bellamy, *Trends in Land Warfare: The Operational Art of the European Theater*. *Defence Yearbook* 1985; Newell, "Modern warfare: Balancing the ends, ways and means."

¹¹ <https://www.cia.gov/readingroom/docs/CIA-RDP82-00047R000300570006-9.pdf>.

¹² Nicosia, "Deep operations in the 21st century"; Baxter, *Soviet Airland Battle Tactics*; Hemsley, *Soviet Troop Control: The Role of Command Technology in the Soviet Military System*; Scott and Scott, *The Soviet Art of War Doctrine, Strategy, and Tactics*.

¹³ <https://faculty.cc.gatech.edu/~tpilsch/INTA4803TP/Articles/Three%20Levels%20of%20War=CADRE-excerpt.pdf>.

The strategic direction of a nation heavily influences the type of logistical demands. In the Russia-Ukraine war the differences between a Russian focus on attrition warfare and a more western oriented Ukrainian focus on manoeuvre warfare also show a different logistical system. Attrition warfare is focused on numbers and mass. It leads to huge demands in personnel and materiel, as epitomised in the Ukraine war. Manoeuvre warfare, seeking an enemy's system collapse, depends on supporting sophisticated weapons and technology. Military organisations can choose and finetune their strategic direction(s) to meet political expectations. Usually, military organisations have multiple strategic directions to cater to a variety of (legally stipulated) strategic tasks.¹⁴ A military organisation's preferred strategic direction matters since it guides use of scarce resources, and it structures the organisation and its capabilities.

To meet all national requirements military organisations tend to struggle with the political leadership in order to combine different strategic directions and translate these unequivocally into organisational capabilities. A lack of proper political guidance, interpretation, intraorganisational politics and bureaucracy are negatively influencing the transformation of the military organisation and to assess their real (continuous) fighting power.¹⁵ Besides, military leadership continuously seeks to balance between hot or real-life operations and cold or all-preparatory activities within the organisation.¹⁶

Like the division of warfare into three levels, (military) logistics as a derivative of military power is also to be separated into strategic, operational, and tactical levels (Figure 9.1):

- On the strategic level we use the word *Sustainability* that can be considered the bridge between the nation's (or coalition's) industrial base and its forces in the theatre of operations.¹⁷ This means a nation's political and public will and capacity (personnel and materials, proper funding, a national force structure and (access to) a (war)industry) to endeavour a conflict or a war. To be able to sustain a war, a nation depends on its own or international/coalition war industry and the resources available.
- The *operational level of war* identifies the theatre of operations. We refer to this level as *sustainment* of operations, which is the comprehensive provision

¹⁴ MoD, "Netherlands Defence Doctrine."

¹⁵ Fetterly, "Defence business planning in Canada"; Krepinevich Jr, "National security strategy in an era of growing challenges and resource constraints"; Soeters, Van Fenema, and Beeres, *Managing Military Organizations: Theory and Practice*; Sookermany, *Handbook of Military Sciences*; Pfeffer and Sutton, *The Knowing-Doing Gap: How Smart Companies Turn Knowledge into Action*; Galeotti, *Putin's Wars: From Chechnya to Ukraine*.

¹⁶ Sookermany, *Handbook of Military Sciences*.

¹⁷ Kress, *Operational Logistics: The Art and Science of Sustaining Military Operations*.

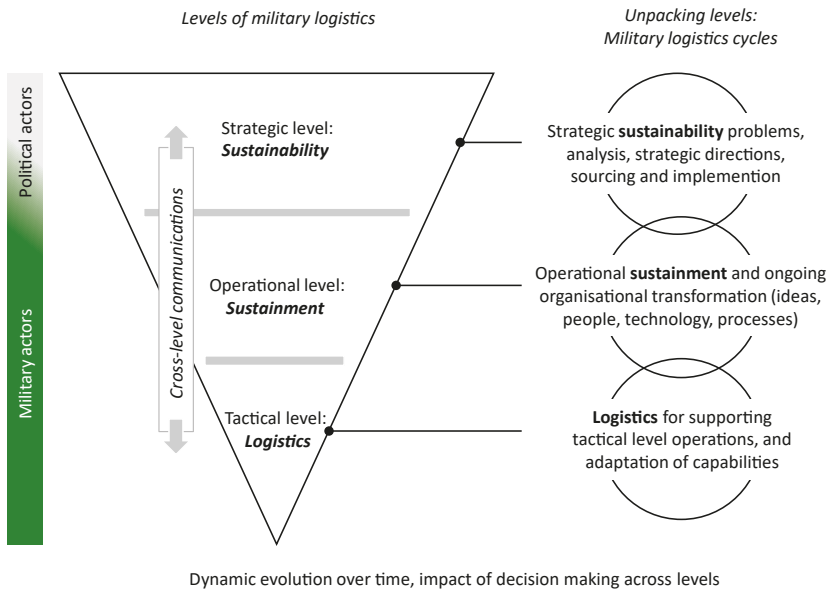


Figure 9.1: A framework for systematic military logistics analysis

of personnel, logistics, medical and general military engineering (MILENG) support required to maintain combat power throughout all phases of the operation.¹⁸ The warring party who can sustain operations longer than his opposing foe will eventually win the battle.

- The tactical level is called *logistics*, enabling/ supporting tactical activities, such as food, water, ammunition, additional equipment and fuel, maintenance repair and overhaul and medical care. The purpose of logistics is to prevent the fighting units from reaching their culminating point¹⁹ and to maintain the initiative and momentum during battle.

¹⁸ NATO, "NATO Standard AJP-3. ALLIED JOINT DOCTRINE FOR THE CONDUCT OF OPERATIONS (version 1), C," 1-24

¹⁹ Culminating point: Prussian military strategist Carl von Clausewitz described it as the moment when the remaining strength is just enough to maintain a defence and wait for peace. Once past, the chance of victory would be foreclosed unless an enemy yielded without engaging in decisive combat. An enemy would prevail if it chose to fight. Culmination could be characterised as a point reached by attackers or defenders in terms of time and space after which stated objectives can't be accomplished, and continued efforts to reach them would significantly heighten the risk of failure or defeat. This point is reached when there is a decisive shift in relative combat power (<https://www.iwm.org.uk/history/operation-barbarossa-and-germanys-failure-in-the-soviet-union>).

Our framework invites dynamic theorising on decision making across levels. At the strategic level, political and military directions impact logistics, such as the trade-off between efficiency and effectiveness. Social and political factors like the fall of the Iron Curtain have led to a reduction of defence budgets ('peace dividend') and a shift away from preparing for large-scale war. Political attention and military organisations' efforts were geared towards expeditionary operations with different capabilities and tactics.²⁰ Strategic logistics, Combat Support and Combat Service Support became focused on such operations far from home bases and with asymmetrical opponents and permissive airspace. Effectiveness can only be achieved through certainty of supply in war. On the tactical level a major criterion to be successful in the mission execution is effectiveness.²¹ So, cross-level decision making orientation tends to be paradoxical.²²

According to Jablonsky (1987) strategic logistics are characterised by a stable environment and macroscopic view, whereas logistics at the tactical level face volatility with a microscopic view. Efficiency as part of the strategic level considers the economic cost of effectiveness. Due to limited financial resources decision makers are faced with choosing between competing alternatives with long-term consequences.

3. Prelude 1: Two historic Russian cases

In 1832, Napoleon Bonaparte left Russia beaten after his troops found the capital city of Moscow burnt to the ground by its own citizens. More than a century later, Adolf Hitler had his divisions march up to the gates of Moscow in 1941 (operation Barbarossa),²³ when he experienced similar difficulties and was forced to retreat involuntarily. Like Napoleon, he experienced the vastness of the country, the harsh climate and terrain, and the unbreakable will of a mostly hostile population. Miscalculation of the importance of logistics to operations strongly contributed to these defeats. We see that the Russian Invasion in Ukraine in 2022 shows some of the same characteristics for the aggressor (the Russian Federation) and the defender (Ukraine). Did the Russian Federation make any miscalculations regarding supporting their invasion? And if they did, what miscalculations did they make and on what level? Using our framework, we consider two Russian cases through a Western lens (Figure 9.2).

²⁰ Simon, "NATO Expeditionary Operations: Impacts Upon New Members and Partners."

²¹ Kress, *Operational Logistics: The Art and Science of Sustaining Military Operations*.

²² Smith and Lewis, "Toward a theory of paradox: A dynamic equilibrium model of organizing."

²³ <https://www.iwm.org.uk/history/operation-barbarossa-and-germanys-failure-in-the-soviet-union>.

Case 1		Case 2	
Logistics of the armed forces of the Soviet Union in WO II		Logistics during The Soviet-Afghan War 1979-1989	
Levels			
Strategic: Sustainability	• The Soviet political top was prepared to dedicate national resources for a proper build-up of its armed forces and to maintain its fighting force • After operation Barbarossa, the government was forced to evacuate hundreds of factories and thousands of workers to the eastern parts of the country • Large scale, simple goal setting and planning • Soviet Union was able to sustain its necessary military effort • Major UK-US support in a so called lend-lease construct • No general collapse of moral, all effort (man and machine) dedicated to Russian army	⇕	
	• The Soviet Union produced around enormous quantities artillery pieces, aircraft, tanks and self-propelled guns • Between the war years of 1941 and 1945, Russia lost between 25+ million soldiers and civilians, and enormous quantities of military materiel. • Stalingrad, as an example of annihilation, laid the foundation for further Russian campaigns to push back the German troops • Learning from the past failures and battles, planning now included improved intelligence gathering and a focus on centralization and coordination • Centrally coordinated transport was based on the so called poor-man's logistics, the horseback, and on the use of trains and railway	⇕	
Operational: Sustainment			
	• Training of commanders and personnel was considered vital and was done on a regular basis • The Soviet Army was able to maintain combat power in the area of Operations (Afghanistan) due to Lines Of Communication (LOCs). • To secure the LOCs (East and West) the Soviet army deployed 29 battalions in total. According to Soviet planning, an estimate of 30+ divisions would be required to control Afghanistan. In reality the number of deployed units never exceeded the equivalent of 5-6 divisions • The Soviets depended on roads, this required major efforts. During the several phases of the war the Soviet army built/ improved a large number of military garrisons for widespread operations	⇕	
Tactical: Logistics			
	• Advantage of fighting on home soil until 1944, i.e. easier to obtain resources via interior lines and civilian facilities • For the front units to be supplied, the armed forces took care of mobile reserve stocks of equipment and supplies • Russian units at the tactical level needed less logistical and service capacity (delivering to divisional reloading points) • The set 'supply' standards for day-to-day could not meet up their expectations leading to hamper military (offensive) operations.	• Some 85% of all the Soviet forces in the Afghanistan theatre were providing basic security (support). • Difficulties in combat service support stemmed from the dispersion of the several divisions over multiple garrisons and so called strong points on the LOC. • Providing logistic support was difficult due to attacks, geographical and climatological circumstances and road conditions.	

Figure 9.2: Systematic military logistics analysis of two historic cases

3.1 Logistics of the armed forces of the Soviet Union in WO II

In the years following the end of WW I and prior to the outbreak of WW II, Russia's dedication to a war economy was telling.²⁴ Although Russia was considered a less developed country in the eyes of many western European powers, the nation managed to keep track with the other emerging super power, Germany.²⁵ At the start of the 1930s the Soviet economy was less industrialised and more labour intensive but started with an advantage over Germany's war industry. This advantage turned into a backlog on Germany's war industry. Although Russia could not keep up with the speed of the more industrialised countries (Germany, Great-Britain, or the US), its prewar efforts not only led to an army with a significant equipment stock (quantity over quality), but also to the establishment of specialised defence industry intricately connected to its civilian industry. The centralised communist system which was carefully built up had to ensure its integrity when encountering external shocks and disruptions, e.g. a world war or conflict, and thus preventing system collapse as happened during WWI.²⁶

The case study of Soviet logistics in WW II shows a system in which all levels of warfare seem united and interact with each other. At the strategic level of sustainability, the support of the war through industry, political will and morale plays a significant role. At the operational level, the means of transportation and the supply throughout the entire theatre of operations are visible in the Russian *modus operandi*. However, there is no strict separation between the several levels of warfare (strategic-operational and tactical) and in some cases, they might overlap with each other. This also implies that there is not always a clear distinction between sustainment and logistics. The so-called 'last mile' from the field army rear to the divisional reloading points was based on a system of delivery, which was the opposite of the German division which had to use its own men to bring forward all its equipment and supplies from the Army depots. Although the Russian war economy and its logistical system to sustain the Soviet cause was not flawless and from time to time even endangered Russian operations, they learned from their first encounter with the German Army in 1941 and changed their structures and systems into a centralised logistic approach trying to overcome logistic problems. This centralised approach had its disadvantages, e.g., inflexibility, especially below army level, but it paid off for the Russian way of war. Its resilience from a national level down to the single logistician is commendable. Therefore the Soviet army cannot be considered as an army which turned the tide of the war solely by its quantity and its leaders' negligence for loss of lives.²⁷

²⁴ Harrison, "The Soviet Union: The defeated victor."

²⁵ Idem.

²⁶ Idem.

²⁷ Dunn, *The Soviet economy and the Red Army, 1930-1945*, 64

3.2 Logistics during The Soviet-Afghan War 1979-1989

The previous case study showed how on the distinct levels the Soviet logistical system was tested at the beginning of 1941, then was reorganised, and eventually supported the advance of the Red Army into Nazi Germany until it reached the gates of Berlin. In the present case study, a bird's eye look at the Soviet operations in Afghanistan will provide insights in its 'logistical' system in the period of a decade (December 1979 – February 1989) during the Cold War era.

In 1979, after a period of great turmoil in the Democratic Republic of Afghanistan (DRA), Soviet General Secretary Brezhnev decided to invade Afghanistan to prevent the country from further spiraling down in a civil war to restore the nation's integrity. Finally, on the 12th of December 1979 Moscow decided to use military force and to invade the DRA.²⁸ The invasion of the Soviet Union's 40th Army on Christmas Eve was thoroughly planned and well executed.²⁹ The Soviets planned to stabilise the political situation by restoring power to the government and to strengthen the army after large-scale desertion which decimated the army by more than 50% by the end of 1979. The last objective then was to withdraw most of the Soviet forces within three years. However, with a nation on fire, a demoralised DRA army, and a probable defeat after withdrawing the Soviet forces, the Polit bureau found itself in a catch 22 situation.³⁰

Until 1985, the Soviet political leadership had seemed unable to decide over the faith of Afghanistan. Only when Gorbachev came to power in 1985 did the issue of Afghanistan seem to become important again. He began negotiations to withdraw Soviet forces and on 15 February 1989, the 40th Army completed its withdrawal after nearly 10 years of fighting one of the Soviet Union's longest counter insurgencies up to then.³¹ Figure 9.2 details our analysis of the conflict across the three levels.

Taking everything into account, it can be said that the Soviets were initially not prepared for the war in Afghanistan but were able to better adapt to the circumstances as the war progressed. They managed to learn from the failures in the first years and rebuild their combat units and a more fitting logistic system capable of supporting a different type of war.³²

²⁸ Dudik, "The Soviet-Afghan War: A superpower's inability to deny insurgent sanctuary."

²⁹ Dudik, "The Soviet-Afghan War: A superpower's inability to deny insurgent sanctuary," 6.

³⁰ Grau and Jalali, "The Soviet-Afghan War: Breaking the hammer and sickle."

³¹ Idem.

³² Dudik, "The Soviet-Afghan War: A superpower's inability to deny insurgent sanctuary," 14.

4. Prelude 2: Transformation of the logistics of Russian armed forces since the Yeltsin era

The turbulent period which led to the disintegration of the Soviet Union in 1989 saw an army in decay. The legacy of the 1979-1989 Afghanistan war, the destructive wars in Chechnya, the restructuring due to the independence of several republics, budgetary problems, lack of personnel and outdated equipment³³ in combination with a lack of vision did not add to stability in the armed forces. It was Vladimir Putin who realised that to achieve political goals the armed forces must be a credible and a combat ready extension of the strategic political structure. This also meant a different view on sustainability and sustainment. Alignment seemed necessary between on one hand the nation's political and public will and capacity (resources in personnel, materials, and knowledge), funding, a national force structure and a (war)industry to endeavour a conflict or a war. On the other hand, there was the need to support the armed forces personnel, logistics, medical and general military support (sustainment) required to maintain combat power throughout all phases of operations.

The development program of the armed forces 2001-2005 and the issuing of several security doctrines starting in 2000 to 2021 saw a shift to operations not only outside the Russian Federation. The domestic, political and social situation in the nation as a matter of state security³⁴ required a military response.

Different insights on military thinking changed the vision of the armed forces: the objectives that had previously been viewed as attainable by direct military action alone could now be achieved by combining organised military violence with a greater emphasis on economic, political, and diplomatic activity, a combination called New Generation Warfare (NGW) and coined by General Valery Gerasimov. By changing the security doctrine, the structure of the Russian armed forces also needed to change, implicitly changing the way how these forces had to be sustained from the strategic (sustainability), through to the operational (sustainment) and the tactical (logistics) level.

Not only had the command structure to be changed to meet the strategic military goals, but also the materiel component urgently needed an update as a part of the new armed forces and its sustainability strategy. Approximately 20 percent of the materiel of the Russian armed forces was up to standards whereas 70 percent of the weaponry of the NATO-countries was modern. The existing problem became even more urgent because of a lack of production of military equipment. For example, between 2000 and 2004, the Russian Army received only fifteen new tanks from

³³ Barrie and Hackett, *Russia's Military Modernization*, 13.

³⁴ <https://www.globalsecurity.org/military/world/russia/doctrine.html>.

a total number of 23,000. Similar numbers applied to other conventional weapon systems for ground, air, and naval forces. This lack of investment in conventional arms seemed to be caused by problems with the Russian military industrial complex (MIC), the declining budget and investments in nuclear deterrence.³⁵

The answer to these problems came in 2008. The New Look program (under President Medvedev) was initiated to transform the armed forces into a modern combat-ready force. It was a reaction to the inferior performance of the Russian armed forces during the war in Georgia. Supported by earnings of oil and gas yields, the State Armament Program of 2011-2020 proved important in realising the desired equipment modernisation ambitions. Russia's ground forces have changed significantly since the New Look began. New equipment has arrived, but not in the quantities required. Instead, there has been a focus on modernising platforms already in service and the integration of more precise and longer-range weapons. The land forces' greatest change has been made in terms of organisation and personnel. In the New Look's early years, authorities planned to transform the ground forces so that their principal unit of action became the brigade, with the intention to produce self-sustaining mobile formations, including their own logistical support units, which were believed to be needed on Russia's future periphery conflicts. However, personnel recruitment did not keep pace with the sustainment ambition. Battalion Tactical Groups (BTGs) (an idea dating back to the 1990s) were introduced in 2012 to generate effective combat power into battalion-sized formations, comprising combat and combat support assets. Lessons learned from experimentation and the Ukraine conflict as well as growing tension with NATO made it necessary to be able to provide higher-level combat support, like heavy artillery. This led to a reintroduction of the divisional level and formations.

The Russian armed forces operational concept, inherited from the Soviet Union era, was modernised during the already mentioned New Look transformation in 2009. Because the logistic system to support the combat and combat support units was still based on the 'echelon principle,' Russia replaced the obsolete Soviet logistics system with a leaner one, involving significant downsizing and the use of outsourcing (by using private companies). This new sustainment concept was initiated but untested in combat operations. Analyses of the renewed logistical system as operated in Ukraine led to the conclusion that 'the future development of Russian military capability asserts that the main restriction of the Russian armed forces will not be availability of forces, but logistics.'³⁶ A remnant from the Soviet era is a strict hierarchical, top-down, structure of operational planning and working. Logistics is not incorporated in this operational planning process. The

³⁵ De Haas, "NAVO en Rusland na de Lissabon Top," 12.

³⁶ Westerlund and Oxenstierna, "Russian military capability in a ten-year perspective," 141.

logistics planning often follows predefined principles, well-exercised scenarios, and calculations of ammunition consumption, attrition, and so on.

Logistics on the army group and brigade levels are standardised and largely follow the same principles as they did in the Soviet era.³⁷ During the Soviet era, the concept for offensive operations was based on the ‘echelon principle,’ according to which one echelon fought till exhaustion while another was readied to be deployed to the frontline. Once replaced, the first echelon would reorganise and be refitted with personnel, equipment, and consumables to again be combat ready. The logistics echelon principles build on army groups supported by one or more Material Technical Support brigades (MTS). Because the fighting units still have limited organic (own) logistics capacity (trucks, drivers, handling equipment) to regain supplies from the rear, they heavily depend on the MTS for strategic and operational logistics. As already mentioned, the echelon principle was released but a new system was not yet in place when the Ukraine war started. Looking at today’s Russian ground forces they do not seem to have the capability to mobilise and sustain a multi-echelon force for a long-lasting war, which means that deployed forces do not have a second echelon and must fight until exhaustion. There is only one opportunity to secure a victory.³⁸ Alternatively, Russia is not willing to commit more troops to prevent loss of public support. Currently, Russia still maintains its peacetime-economy and is not (yet) obliged to switch to a war economy, although current information suggests a substantial surge of security spending.³⁹

5. The Ukraine conflict: Russian logistics phases of the conflict⁴⁰

We can now embark on our analysis of the present Ukraine war.

Phase 1. Prior to the conflict in Ukraine the Russian armed forces began with a massive build-up of troops near the Ukrainian border. Russian Authorities addressed that this deployment of troops was part of exercises, Zapad 2021.⁴¹ This was the period end of 2021 and beginning of 2022, to 24th of February. Until that

³⁷ Grau and Bartles, “The Russian way of war: Force structures, tactics, and modernization of the Russian ground forces.”

³⁸ McDermott, “Russia’s strategic mobility – Supporting “Hard Power” to 2020?” 32.

³⁹ <https://www.economicsobservatory.com/ukraine-whats-the-global-economic-impact-of-russias-invasion.>; <https://www.bruegel.org/analysis/russian-war-economy-macroeconomic-performance>.

⁴⁰ When we turn to Russia in the context of the Ukraine conflict to empirically examine these insights, we must note that the conflict is ongoing, and information is incomplete and possibly incorrect. Propaganda efforts are likely within and beyond Russia’s borders.

⁴¹ Skoglund, Listou, and Ekström, “Russian logistics in the Ukrainian war: Can operational failures be attributed to logistics?”

specific moment, many of the Russian Military Forces at operational and tactical level were not expecting to cross the border with Ukraine, as part of the Special Military Operation. This was how the Russian Government explained the violation of the Ukrainian sovereignty. When an army is expecting to be part of an exercise, there is always an end-date attached to that exercise. This means also that the majority of the logistic capability is planning on a re-deployment of that exercise instead of moving forward and going to prolonged war.⁴² Also supplies and technical support are planned to return to Home Base. When transitioning from exercise to war, the conditions and dynamics of logistics normally change. Logistical demands are a function of the selected Course of Action (COA) and the dynamics of the war. The requirements for the re-supply of ammunition, spare parts, and other supplies are inherently unpredictable. A full-scale war includes casualties and damaged equipment, leading to increased demands for transportation, medical treatment, and maintenance. Russia seemed to have ignored lessons from the past when planning this deployment: political objectives were not aligned with sustainability and sustainment principles. Factors at play include misjudging the will of the Ukraine population and underestimated time, and space and force dimensions. These latter include increasingly stretched Lines of Communication (LOCs) supply lines when Russia invaded the Ukraine from multiple directions.

Phase 2. The plans for an invasion have been known already at some levels in the command chain, yet logistics was apparently not part of that decision-making process. If most of the logistics plans for Zapad-2021 were made for the exercise, shifting from exercise to a war would create a logistics vacuum after the intended ending of Zapad-2021. Even if there existed aggregated plans for transport and sustainment for the invasion, there would be no time for maintenance and refurbishment of equipment used during the exercises. Furthermore it is observed that the small number of trucks and the failure of trucks (a structural flaw of the current force composition) has been hampering the speed of operations (like WW II). Operational units lacked transportation capacity.

Phase 3. The Russian war in the Kyiv region was apparently planned to be short. As the first step in the operation, the taking of the Antonov Airport (an operation typically depending on advantage), failed. Logistics were suddenly required to play a different role in a different operational setup. So, logistics had to adapt their plan again. We can assume that there existed a (limited) logistics plan to support the chosen COAs when the operation started on 24th February 2022. The Kyiv COA was to replace the political leadership of Ukraine within a few days. Taking the Antonov Airport in Hostomel near Kyiv through an airborne operation was a crucial

⁴² Van Kampen, Van Fenema, and Grant, "Getting there and back: Organizing long-distance military logistics with customers in mind."

component of this plan. The Russians probably planned to use this airport as a logistical hub. This observation would support the assumption that the war would be over in a few days, typical of a strategic direction focused on advantage rather than attrition. If that is true, the operation did not have to put much effort into logistics other than ensuring that the forces involved could bring along all the equipment and supplies for the initial phase.⁴³ Typically, Russian forces carry supplies for three to five days.⁴⁴ Fuel and ammunition are the volume drivers, and a short operation would reduce the required volumes significantly. The follow-up logistics would have been coordinated from Hostomel or another suitable position once the Russian troops had gained control of the area. When this COA failed, after multiple attacks on the airfield, it appears that there was no contingency plan for the forces.

Phase 4. Since the Russian general staff tends to give detailed orders instead of an operational intent, commanders on the tactical level did not know what to do. These commanders did not have the capabilities to adapt to changing unforeseen situations. Tactical level units typically have only 3-5 days of supply, contradicting attrition warfare. Changing towards that type of warfare proved difficult. Russian forces had sufficient time to prepare operations in the eastern and southern parts of Ukraine after years of support to the separatists in the Donbas region and Crimea. But here, too, the war proved to be more difficult than expected. Also, in the eastern and southern parts of Ukraine, the question can be raised again: to what extent was logistics involved in the planning process of going to war against Ukraine? A comprehensive operational plan seemed to be lacking on the Russian side, let alone integration of strategy, operation, and execution. Initially only one echelon was employed in the south-eastern part of Ukraine. This put heavy strain on the logistics, since the combat forces started to run out of supplies after four to five days. Adding to this, resupplying the force by road required more logistics vehicles in decent shape than the combat units and the MTS could provide. This means that troops in combat were to be supported directly, instead of units withdrawn from combat when two echelons were used. On the levels of logistics and sustainment, integrated planning and execution were lacking (e.g., transferring from railroad to road). The loading and unloading of cargo trains is a labour-intensive and time-consuming operation, which means that logisticians want as few railheads as possible. Handling equipment, storage transfer facilities and knowledge are required to facilitate all activities. From the railheads, supplies are distributed by trucks.⁴⁵ New

⁴³ Skoglund, Listou, and Ekström, "Russian logistics in the Ukrainian war: Can operational failures be attributed to logistics?"

⁴⁴ Grau and Bartles, *The Russian Way of War: Force Structures, Tactics, and Modernization of the Russian Ground Forces*.

⁴⁵ Barnett and McCarthy, "Russian logistics and sustainment failures in the Ukraine conflict status as of January 1, 2023."

distribution hubs would be established inside Ukraine as the Russian campaign was supposed to progress. The logistics principle was built on railway distribution as close to the combat units as possible, and wheel-based distribution for the last mile only. But the capacity for this final distribution by road was, evidently, too limited. But transferring from railroad to road supply is easier to conduct within a country's own territory rather than in conquered territory with limited facilities. Furthermore, logistics effectiveness decreases as the distance that must be covered increases.⁴⁶ The importance of the design of log-units and the number of (manned) trucks available came to the fore. If logistics are not aligned with the operational pace, supplies ordered to close the gap will eventually surpass the needs of the combatants. This stems from a tendency to order more than required, to cover for uncertainties in distribution time, supply opportunities, and actual demand. Consequently, fighting units receive too much supply at the wrong time and place, which could congest supply lines and fill up storage capacity.

5.1 Initial interpretation

Russia has struggled to devise its security strategies and capability portfolio, embracing a number of strategic directions with their own technology and logistics implications,⁴⁷ including international independence,⁴⁸ nuclear deterrence,⁴⁹ combining technology-enabled advantages⁵⁰ with prolonged massive-scale warfare,⁵¹ and influencing capabilities.⁵² The country has embarked on a path of transformation but seems to be challenged to refine and materialise its strategic direction. Specifically, in the present era, the Russian Army works with echelons where army groups are being supported by one or more Material Technical Support brigades

⁴⁶ Prebilič, "Theoretical aspects of military logistics."

⁴⁷ https://militairespectator.nl/artikelen/russische-nucleaire-doctrine-een-inkijk-diepliggende-angsten#_ftn17.

⁴⁸ Trenin, "The revival of the Russian military: How Moscow reloaded."

⁴⁹ <https://www.marshallcenter.org/en/publications/marshall-center-papers/transformation-russian-military-doctrine-lessons-learned-kosovo-and-chechnya/transformation-russian-military>; <https://militairespectator.nl/artikelen/russische-nucleaire-doctrine-een-inkijk-diepliggende-angsten>.

⁵⁰ This makes the tension between scale and innovation notable: for a given budget, choices must be made between the number of assets to be upgraded and the level of technology improvement.

⁵¹ During World War 2, the US seemed to be able to combine advantage with mass, <https://eh.net/encyclopedia/the-american-economy-during-world-war-ii/>; although Germany had a scientific and technological edge in some areas; O'Reagan, *Taking Nazi Technology: Allied Exploitation of German Science after the Second World War*.

⁵² Bouwmeester, "Krym Nash: An analysis of modern Russian deception warfare."

(MTS).⁵³ For transportation they heavily rely on the railway system,⁵⁴ and for fuel and water on transportation through pipelines.⁵⁵ This leads to limited capacity in operations with the result of less freedom of movement in choosing how to operate. With this limited capacity it is also difficult to execute the loading and unloading of trains, because this requires a lot of capacity. In the design of the Russian armed forces it seems there is only limited room for support. The Russian Army operates with fewer support soldiers than other military organisations, a different so-called tooth-to-tail ratio. It is estimated that a Russian Battalion Tactical Group has a strength of 700–900 soldiers. About 150 out of this number can be considered as logistic capacity where they can get support from larger units. The U.S. Army deploys 10 support soldiers for every combat soldier,⁵⁶ according to retired Lt. Col. Vershinin, whose career with U.S./NATO forces included building logistical models.⁵⁷

The translation from strategy to a military force that can execute this strategy is essential. Besides that, the Russian Military Leadership underestimated the will and ability of the Ukrainian armed forces to fight. The Russian Military capability had a marginal logistical support, so the Russians were depending on quick victory and success (affirming the strategic direction of advantage). As we know now, this quick victory was not reached, and the problems of the Russian armed forces grew rapidly. Shifting from advantage to for instance attrition is a major challenge. The support units were not able to give support to ensure a victory in a brief time. The problems were made even bigger by seemingly not having an integrated operational planning process where logistics was involved. The shortcomings of Russian logistics are due to previous reductions, insufficient maintenance, an untested logistical system (partly based on outsourcing), and the fact that logistics is not an integrated part of Russian decision-making at every level. But for the most part, the operational failures are associated with unrealistic planning assumptions. The operation was not over within the expected limited number of days; it escalated to a full-scale war presenting logistics with challenges it was not prepared for.⁵⁸ Russian logisticians have demonstrated an ability to adapt and

⁵³ Skoglund, Listou, and Ekström, “Russian logistics in the Ukrainian War: Can operational failures be attributed to logistics?”

⁵⁴ <https://debalie.nl/programma/1-jaar-oorlog-in-oekraïne-24-02-2023/>; <https://debalie.nl/programma/1-jaar-oorlog-in-oekraïne-24-02-2023/>.

⁵⁵ Skoglund, Listou, and Ekström, “Russian logistics in the Ukrainian War: Can operational failures be attributed to logistics?”

⁵⁶ <https://www.washingtonpost.com/world/2022/03/30/russia-military-logistics-supply-chain/>.

⁵⁷ Skoglund, Listou, and Ekström, “Russian logistics in the Ukrainian War: Can operational failures be attributed to logistics?”

⁵⁸ Zabrodskyi et al., “Preliminary lessons in conventional warfighting from Russia’s invasion of Ukraine.”

support this escalation, particularly on the east and south-east fronts, principally, perhaps, because of the access to a working railway system, and because the war now follows an established stratagem reminiscent of an earlier embraced strategy of attrition: destroying everything before slowly moving forward. This finds its origin in the Cold War.⁵⁹

5.2 Analysis

Types of war and logistics. When reflecting on the Ukraine war, Russia switched from an exercise towards an advantage-based operation to capture Kyiv and control the Ukraine. This seemed to rely on the Russian playbook for capturing neighbouring countries⁶⁰ in order to bring back the desired geopolitical situation from before 1989.⁶¹ Once this effort failed, it was forced to a more traditional mass-scale and prolonged type of warfare that it strategically no longer strived for and its armed forces not organised, trained and equipped for.⁶² In a logistical sense, moving around the Ukraine and relying on rail implied a massive logistics effort. Russia's military organisation struggled to follow and support the massive-scale multi-front attacks. These continuously demanded elevated levels of materiel, ammunition, fuel, and personnel – including challenges of coordinating resources with the Wagner group. In addition, massive scale operations were interspersed with some advantage-based efforts such as the use of hypersonic or precision missiles; these efforts required sophisticated weapons, production and possibly logistics.

Strategic walk and talk. Strategic directions differed from the de facto operation that evolved in the Ukraine. For instance, dependence on other countries increased for technologies like drones. An undesirable mobilisation and training of civilians (including prisoners) was necessary, as well as hiring PMCs like the infamous Wagner Group military, and military units of the Chechen Republic under Kadyrov. These sourcing options complemented Russia's regular military. Dependence on production capacities in former Soviet Union countries also became more notable. Specifically, logistics vulnerabilities included integration with operational planning and manoeuvre processes, upstream production capacity and availability of

⁵⁹ Skoglund, Listou, and Ekström, "Russian logistics in the Ukrainian War: Can operational failures be attributed to logistics?"

⁶⁰ https://militairespectator.nl/sites/default/files/bestanden/uitgaven/inhoudsopgaven/militaire_spectator_5_2023_selhorst.pdf

⁶¹ <https://worldcrunch.com/focus/russian-army-failure>.

⁶² Skoglund, Listou, and Ekström, "Russian logistics in the Ukrainian War: Can operational failures be attributed to logistics?"

advanced technologies, and multimodal switching. The vulnerabilities showcase a mixture of logistics problems associated with multiple strategic directions.⁶³

6. Implications for practice: Dilemmas

Evaluating the transformation of the Russian armed forces from the breaking up of the Soviet Union up to the present situation we see that the Soviet armed forces and its principles were getting obsolete and that the sudden and chaotic emergence of the Russian Federation armed forces resulted in a non-compliant and not combat ready force. Without a clearly related political and military strategic vision, enough adequate resources (budget, personnel, materiel, doctrine, and organisation) and sharp vision on sustainability, sustainment and logistics and its interactions, it is impossible to have armed forces that give enough substance to the political and military strategic goals of the Russian Federation. At the same time, one can note the risk of choosing for a particular type of warfare and shaping a force that loses relevance in modern/future combat. The conflict will therefore lead to strategic reflections on the validity of pre-Ukraine embraced directions, and a renewed effort to communicate and learn across-levels. At present, the complex operation re-activates latent routines befitting a large-scale and prolonged type of warfare.⁶⁴ It is likely that these routines can be reactivated in a (sufficiently) effective manner and will be combined with the more contemporary strategic directions mentioned.

In the longer term, the Russian Federation will try to rejuvenate its 'revival.'⁶⁵ It may consider a new mixture of multiple strategic directions to avoid betting on operations that do not play out according to expectations. This will further confront decision makers (again) with pressure to deal with scarce resources and a variety of sourcing/logistics concepts and capabilities (including reliance on Private Military Companies like Wagner). It will push leadership to improve transformation effectiveness,⁶⁶ enhance performance by its industry,⁶⁷ and explore opportunities for economic growth.⁶⁸ The strategic dilemma will stretch beyond the military's boundaries. In Russia and on the western side, discussions on industry capabilities,

⁶³ <https://worldcrunch.com/focus/russian-army-failure>.

⁶⁴ Van Fenema and Romme, "Latent organizing for responding to emergencies: Foundations for research."

⁶⁵ Renz, *Russia's Military Revival*.

⁶⁶ McDermott, *The Transformation of Russia's Armed Forces: Twenty Lost Years*.

⁶⁷ <https://www.fpri.org/article/2020/04/russias-defense-industry-between-political-significance-and-economic-inefficiency/>.

⁶⁸ Oxenstierna and Wannheden, "The Russian economy and military expenditure in light of the war in Ukraine and economic sanctions."

logistics depth and reduction of international dependence gain prominence.⁶⁹ In a broader sense, Russia faces challenges of sustaining political legitimacy when combining defense investments with its population's real income given a limited national income and sanctions.⁷⁰

7. Implications for research, and conclusion

We conclude with directions for further research.

Multilevel Thinking and Evolution of Time. The Ukraine conflict illustrated how military forces fighting in the present are deduced from earlier choices and investments. With multilevel thinking, attention can be paid to temporality;⁷¹ after all, strategic agency concerns opportunities for future states of the organisation.⁷² At any moment, the military that fights is a product of multilevel processes, including lengthy technology life cycles, expectations in the political arena, and financial resources. Researchers can explore how (problematic) transition of armed forces – including their resources and logistics – can be understood against the backdrop of shifting understandings of desired capability mixes.

Strategic direction and operational-tactical adaptation. This case illustrates the dynamics of strategies that change, or one could say drift,⁷³ in interplay with operational-tactical adaptation. Russia and the Ukraine keep trying new technologies and operational concepts in offensive and defensive manners. Our multilevel framework can afford researchers with new directions for research, such as activation of vertical and horizontal coordination. Despite properties of bureaucracies, more energetic processes seem required to win a present fight and prepare for future ones.⁷⁴ Such processes encompass vigorous multilevel learning⁷⁵ and adoption of analytics.⁷⁶

Challenges of vertical alignment. Zooming out, our study can be further related to ideas in business administration on coordinating/aligning strategic and organisational processes. A common theme is reducing 'dissonance' or improving configurational fit (1) between an organisation and its environment, and (2) across

⁶⁹ <https://twitter.com/hansdamen/status/1661728409872134146>.

⁷⁰ Oxenstierna and Wannheden, "The Russian economy and military expenditure in light of the war in Ukraine and economic sanctions."

⁷¹ Emirbayer and Mische, "What is agency?"

⁷² Sminia and Valdovinos, "Implementing strategy and avenues of access: A practice perspective."

⁷³ Voronov, Glynn, and Weber, "Under the radar: Institutional drift and non-strategic institutional change."

⁷⁴ Quinn and Dutton, "Coordination as energy-in-conversation."

⁷⁵ De Waard et al., "Learning in complex public systems: The case of MINUSMA's intelligence organization."

⁷⁶ Morgan et al., "Military applications of artificial intelligence."

and at multiple organisational levels within organisational boundaries.⁷⁷ For instance, business model literature advocates alignment of customer oriented processes, internal activities and sourcing.⁷⁸ Others refer to the interplay of external and internal capabilities,⁷⁹ resource management for value creation,⁸⁰ or the interplay of market requirements and operational resources (operations management).⁸¹ In a normative sense, organisations are encouraged to attempt to match their primary and supportive processes to strategic demands. Similarly, business organisations tend to choose between for instance serving mass versus niche markets.⁸² Researchers can problematise the extent to which these ideas apply to the military, which must be prepared for any type of traditional, current and future unknown warfare.⁸³

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⁷⁷ Benbya, Leidner, and Preston, "MIS quarterly research curation on information systems alignment research curation team"; Bacharach, Bamberger, and Sonnenstuhl, "The organizational transformation process: The micropolitics of dissonance reduction and the alignment of logics of action"; Storbacka and Nenonen, "Scripting Markets: From value propositions to market propositions."

⁷⁸ Foss and Saebi, "Fifteen years of research on business model innovation: How far have we come and where should we go?"

⁷⁹ Wilden et al., "Dynamic capabilities and performance: Strategy, structure and environment."

⁸⁰ Sirmon, Hitt, and Ireland, "Managing firm resources in dynamic environments to create value: Looking inside the black box."

⁸¹ Slack, Lewis, and Bates, "The two worlds of operations management research and practice: Can they meet, should they meet?"

⁸² Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors*.

⁸³ Van Fenema and Soldaat, "Restrategizing digitalization in the military."

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