

THEORETICAL-PRACTICAL INCONGRUENCES OF LOGISTIC SUPPORT IN THE FIGHT FOR THE CONQUEST OF KYIV

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In the initial stage of the invasion of Ukraine, logistic support for Russian forces faced major difficulties. Although the Russian Armed Forces' logistic doctrine outlines a robust capacity to support forces, in practice, poor execution of logistic support led to operational failures. In this article, we will highlight the aspects that contributed to Russia's inability to logistically support its own forces in the fight for the conquest of Kyiv. Thus, we will examine theoretical elements regarding the conception and organization of material-technical support structures and will detail practical aspects observed in the execution of logistic support for Russian troops. The purpose of the article is to highlight the discrepancies between the theoretical aspects and the execution of logistic support for the Russian forces that fought in the battle for Kyiv. The authors aim to justify that planning and logistic estimates during the battle for Kyiv did not adhere to relevant doctrinal directions, which contributed to military failures. As for the employed research method, we opted for content analysis of data extracted from military specialties books, doctrines, and publications in the field of military sciences, as well as from the NATO collection of lessons identified on the Russian-Ukrainian front.

Keywords: logistic support; Russian forces; battle for Kyiv; doctrine; military science;

INTRODUCTION

In this endeavour, we aim to highlight theoretical aspects of logistic support in offensive operations. The unsuccessful application of the mentioned aspects by the Russian armed forces contributed to the failure of the battle for Kyiv, with incalculable losses even at this moment. We started from the observed state of affairs in the theoretical space of Russian military logistics, from which we determined that planning and logistic estimates during the battle for Kyiv did not adhere to relevant doctrinal directions.

To support our exposition, we analysed doctrinal elements of the logistic conception of the Russian Federation's armed forces and related them to the organization of logistic support forces and the specific activities carried out, to the conception of material provision for the forces, and to logistic support for expeditionary operations.

In practice, it has been demonstrated that the current Russian military logistic system is neither organized, trained, nor equipped to provide the expeditionary logistics necessary for operational success. The main dilemmas faced by the Russian armed forces were significant logistical problems, including difficulties in road and rail supply. While some authors (Martin et al., 2023) argue that the failure to achieve the objective of conquering Kyiv by the Russian armed forces was largely caused by poor planning by Russian logistician's support for the operation, other specialists believe that military failure led to the inability to achieve proper logistic support (Skoglund et al., 2022). Regardless of the position we take, one fact is certain: the execution of logistic support for Russian troops in the battle for Kyiv faced incalculable difficulties.

The consequences of the execution of the plan to occupy Kyiv in 2022 demonstrated the application by the Russians of a deficient strategy, especially for achieving logistic support. In the initial stage of Russia's offensive operation, the repercussions were clear: military convoys were ambushed, essential military equipment (such as battle tanks) broke down or ran out of fuel, insufficient combat rations, illnesses, and frostbite among soldiers (Berkowitz, Galocha, 2022).

THE CONTEXT OF THE BATTLE FOR KYIV FROM A LOGISTIC PERSPECTIVE

In the spring of 2022, the entire world witnessed the significant losses of the Russian armed forces in the battle for Kyiv and the success, which was very hard to anticipate in February 2022, of the actions of the Ukrainian armed forces. 24 February 2022 marked the initiation by the Russian Federation of a special operation in Ukraine, aiming to quickly and decisively occupy the capital, Kyiv, and to change the current government. The ground troops of the Russian Federation began the attack on Kyiv along two directions. The first direction, approximately 150 km long, was the Belarus-Kyiv axis, where forces equivalent to four regiments, with about 15,000-20,000 soldiers each, were deployed (Nistorescu, 2022, p. 133). The second offensive direction involved forces at the level of two divisions, deployed from the Chernihiv and Sumy regions toward the capital of Ukraine (Vershinin, 2022).

Most likely, Russian strategists planned the operation based on the assumption that the capital of Ukraine would be conquered within three days. Contrary to Russian plans, the achievement of the objective to occupy Kyiv and overthrow President Zelensky's government was blocked by the resistance of the Ukrainian armed forces. Numerous analyses and lessons drawn by military specialists address the causes of the operational failure of the Russians. Among the most commonly cited arguments, the logistical failure is predominant.

Challenges became evident with the identification of the supply needs of the assault troops for fuel, ammunition, and spare parts for damaged equipment. Logistic support forces failed to supply the assault troops with materials, mainly due to prolonged communication lines and lack of access to the railway infrastructure, which is vital for ensuring material supplies (Jones, 2022, p. 1). Furthermore, supply convoys of the Russian troops fell into ambushes organized by the Ukrainian forces, as the security of the rear area for the assault forces was not established. The effort on logistics was compounded by the needs for artillery ammunition, as fire support for the operation was only minimally provided by aviation.

It can be stated, almost with certainty, that planning an offensive operation along multiple axes over a front that stretches for over a thousand kilometres would inherently cause significant stress for the armed forces of any current major power, even in theory. In practice, an attack along multiple directions was heavily impacted by the inability of the Russian military logistic system to support the operational execution of the offensive plan against Kyiv. The failure to achieve logistic support is evident, as evidenced by the roadblock involving logistic vehicles. Over a length

of 70 km, military logistic columns became stuck on the only road north of Kyiv, with the assault troops no longer able to be resupplied with food and essential equipment.

The uninterrupted functioning of supply chains is fundamental for military logistics, whether in military or civilian contexts. Providing combat forces with goods such as ammunition, fuel, food, and spare parts for damaged equipment as quickly as possible can dictate the outcome of an operation, as some authors opine it happened with the Russian forces in the battle for Kyiv (Martin et al., 2023). The consequences of supply chain dysfunctionality are difficult to measure, but they certainly impact how military operations, or even civilian society, function. In fact, if we can draw a conclusion from the COVID-19 pandemic and the pressure on supply chains due to this crisis (Helper, Soltas, 2021) or from the lessons observed in the Russo-Ukrainian conflict, we could say that the uninterrupted operation of logistics systems is essential for the efficiency of today's society. Certainly, these crisis situations have affected how decision-makers within governments, armies, and industries relate to vulnerabilities in supply chains. A clear demonstration of the importance of functional supply chains emerged as early as the first months of the Russo-Ukrainian war (Cunningham, 2023, p. 2).

According to analysts, the Russian armed forces faced considerable logistical challenges, mainly due to inadequate preparation and planning of logistics, as the logistical estimates were made incorrectly, despite the Russian forces having both doctrinal support and technical capabilities.

THEORIES OF LOGISTIC SUPPORT

It can be almost accurately assumed that the initial political objectives of Russia in February 2022 were the capture of Kyiv, the collapse of the current Ukrainian government, and the annexation of certain Ukrainian territories to the Russian Federation. However, the strategy that was supposed to achieve these objectives was not only flawed but also poorly implemented. We will further refer to significant theoretical aspects for planning and estimating the logistic support needs of the armed forces in military operations.

One of the lacking factors was the execution of logistic support from the Russian armed forces, which had been absent since the initial phase of the conflict and even during the unfolding of the operation. One aspect that seems not to have been given enough consideration is the **principle of logistic sufficiency**. According to this principle, the levels and distribution of logistic resources must be sufficient to reach the necessary levels for the readiness, sustainability, and mobility

of the forces. Moreover, Russian military strategists did not accurately appreciate the requirements to which the national defence infrastructure had to respond, and it was overwhelmed not only by operational demands but also by the effects of the economic sanctions imposed by the European Union countries. In addition, the motivation of the Ukrainians to defend their existence as a state and the high degree of resilience demonstrated were factors that caught Russian planners by surprise, especially in the field of logistics (Ti, Kinsey, 2023, p. 383).

Military experts agree that the Russian armed forces were sized to demonstrate rapid and overwhelming fighting power. However, it is clear that the failure of the operation, at least in the initial months, was due to weaknesses in the Russian logistic system. We can assert, almost with certainty, that Russian military strategists did not expect the response from the Ukrainian armed forces, but rather had in mind a quick and categorical victory. Michael Kofman, the director of the program for Russian studies at the Center for Naval Analyses (CNA) in Virginia, USA, opined in March 2022 that: “*We can suspect [that Russians] did not properly organize the logistics necessary for an effective Plan B, which was to have an actual, serious fight in what is the largest country in Europe outside of Russia*” (Berkowitz, Galocha, 2022).

In this paradigm, the war in Ukraine can be classified as a “*conflict between hopelessly unequal forces*”, following the **model of international conflict** proposed by Boulding (1988, p. 244). The American economist classifies potential participants in a conflict into six types: 1) tribe, 2) feudal or agricultural society, 3) universal agricultural society, 4) industrial power, 5) superpower, 6) world state (global). He envisions three categories of international conflict in which the previously mentioned powers can be engaged: (A) conflict between equals, (B) conflict between unequals, and (C) conflict between hopelessly unequal forces. Although the war between Ukraine and Russia appears to have begun under the auspices of category (C), it nonetheless shows a change in its character, opposed to the reasoning of conventional international conflicts. To draw a simplified analogy, we can state that Ukraine fits into Boulding’s theory as an agricultural society. Since February 2022, this state has found itself involved in a conflict with a superpower, the Russian Federation. Thus, we can observe that the nature of the Russo-Ukrainian conflict adheres to the category of conflicts between hopelessly unequal forces. The inequitable conditions of hostilities during the initial phase of the Russian invasion were balanced by factors we intend to detail further. The first factor refers to the possibilities of logistic support for the Russian armed forces expeditionary operations. The second factor we will elaborate on is the requirement to adapt

the Russian armed forces logistic doctrine to the offensive operation in Ukraine, with an emphasis on the battle for Kyiv (Boulding, p. 245).

Organization of the Logistic Support Structures of the Russian Forces

For a clearer understanding of the logistic support actions of Russian forces, we consider it necessary to examine some doctrinal elements of the **logistic conception in the Russian Federation’s armed forces**. We will refer to the organization of logistic support forces and the specific activities carried out, the conception of ensuring materials for the forces, and the logistic support for expeditionary operations.

The term used for the structure executing logistic support in the Russian armed forces is the **Material-Technical Support Structure** (*Materialno-tekhnicheskogo obespechenie*), and we will continue to use the acronym MTO (Milevski, 2022, p. 3) to refer to these organic logistic support structures. Russian armed forces logistics, despite its differing nomenclature from that of Western armed forces, adheres to the same logistic principles and performs the same specific functions necessary to mobilize troops and provide them with all the essential materials for conducting military actions. Organizationally, the echelons subordinate to a brigade do not possess independent material-technical support structures, and specialized support is provided through organic structures (platoon or company). Thus, combat structures up to the brigade level are supported by elements belonging organically to the unit or received as support, to ensure the troops have supplies and to carry out maintenance of equipment. As Grau and Bartles note, within the ground forces, regiments are logistically supported by a company MTO, manoeuvre brigades have a battalion or a company MTO in their composition (depending on the type of brigade), and divisions are supported by a battalion MTO. At the level of the combined arms army (CAA), a MTO brigade operates, managing supply depots (Grau, Bartles, 2016, p. 322).

We can observe that the **specific activities of the material-technical support structures** (Ib.) have a certain correspondence in the logistics of the Romanian Armed Forces:

- providing armed forces with weapons and military equipment;
- supplying fuel and materials (uniforms, equipment, inventory and maintenance goods etc.);
- feeding and equipping personnel;
- ensuring the facilities necessary for washing and repairing clothes;
- repairing and restoring the functionality of roads and railways;
- organizing the transport of personnel and materials;
- receiving, managing, and distributing materials from depots;

- organizing preventive maintenance and repair of weapons, military equipment, and materials;
- ensuring maintenance and repair services for buildings and public utilities in military installations;
- carrying out calibration activities in the field of metrology;
- training military personnel from other specialties regarding the execution of specific material-technical support activities;
- conducting controls related to feeding and fire protection in military installations (*Romanian Armed Forces Joint Logistics Doctrine*, 2023, p. 28).

According to the organizational and personnel structure, mobile and stationary forces and facilities are included in the MTO system of the military district to which they belong. The basis of the mobile component consists of permanent logistic teams with a high level of response, while the foundation of the stationary component consists of complex storage bases that contain all the necessary stock quantities of material and technical means. According to statements by Major General Andrey Bulyga, the logistics deputy commander of the Central Military District (Vershinin, 2022), the main task of the MTO is to maintain the combat readiness and combat capability of the troops through the effective use of military command and control organs, forces and assets of the MTO.

The logistical concept of the Russian armed forces stipulates that the MTO brigade sends supplies from warehouses to the MTO battalions that support the manoeuvre brigades of the army groupings and to the artillery groupings of the brigade, as represented in *figure 1*.

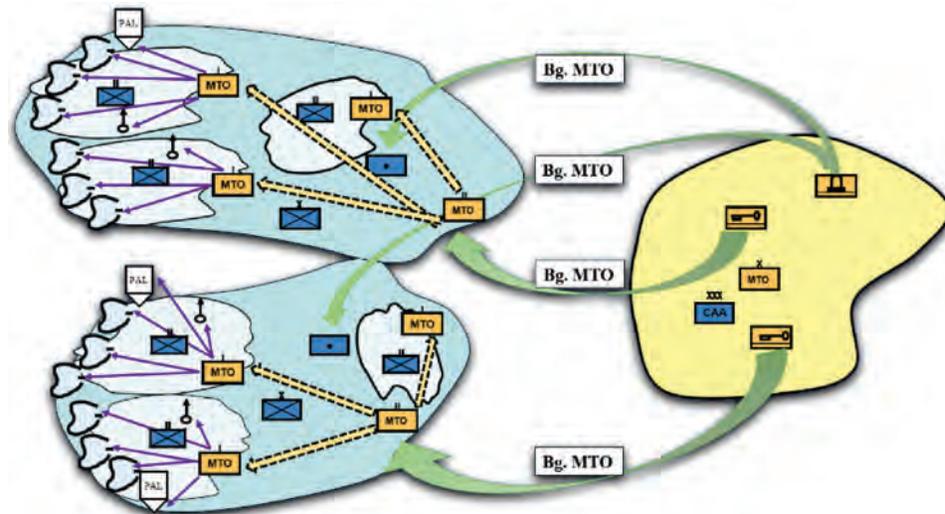


Figure 1: The flow of material supply to the Russian forces (authors' design)

The MTO battalions are to push materials to the MTO companies and, as applicable, to the mortar batteries. The MTO companies supporting the manoeuvre battalions will resupply combat units and combat supply points. If the MTO structures cannot push all necessary supply materials forward, their effort will be supplemented by the MTO battalion (Martin et al., 2023, p. 3).

Logistical Support for Expeditionary Operations

A definition of expeditionary operations can be simplified by the capability to project military power over extended lines of communication in a distant operational area to achieve a clearly specified objective (*Joint Operations, Joint Publication 3-0*, 2017, p. 213). Clearly, by their nature, expeditionary operations are offensive since few situations can conceive of a defensive operation requiring the deployment of troops over long distances. In this paradigm, the invasion of Ukraine demonstrates a classic case of expeditionary operation requiring adequate logistical capabilities (Ti, Kinsey, 2023), particularly for robust resupply of troops over long distances.

In fact, the lengths of supply lines, according to viability theory, constitute a critical factor for conducting expeditionary military operations. Boulding demonstrates that the distance from the garrison where an armed force operates is inversely proportional to the combat capability of the force. This fact means that mobilizing forces over long distances manifests direct effects on both resupply capacity and the morale of exhausted troops. He also shows that long deployment distances imply extended supply lines that require additional protection, and thus, the combat capacity of the troops is consumed in meeting the need for security of communication lines (Boulding, p. 230).

Moreover, to support a large-scale operation over a prolonged period, particularly in an enemy territory conflict, Russian forces must rely on the railway system according to their own doctrine. In fact, with respect to force projection, perhaps the most valuable logistical capability in the Russian toolkit is the vast national railway system. The civil and military transport system largely relies on the railway infrastructure, being the primary means of providing logistical support for most military operations. Due to the importance of railways for military operations, the Russian Federation has established a separate branch, the Railway Troops, intended for the protection, servicing, and maintenance of the railway service for its armed forces. The military railway service consists of ten brigades and several independent battalions dispersed throughout Russia, operationally attached to the respective military districts. These units provide logistical support related to railway transport for military operations, including repairs, bridge construction, and camouflage (Grau, Bartles, p. 327).

Loss-of-Strength Gradient

According to viability theory, Boulding describes the conditions under which a state (or other conflict actor) can dominate another state. The theory, rooted in economics, states the conditions under which an entity has the capacity and motivation to dominate or control another entity (state, military force, commercial firm etc.). Subsequently, Boulding proposes a **model of the loss-of-strength gradient** for two opposing forces with different combat capability proportions. Specifically, the model asserts that an armed force reduces its combat capability as it moves away from the base location, and the sphere of influence (the area where the force is dominant) shrinks until the combat capability is equal to that of the opponent (point D in figure 2). Moreover, the costs related to the transport of troops and supplies will increase exponentially with the distance of deployment.

In this situation, we can discuss two states (A and B) that have their headquarters or general command at points A and B, respectively. The distance between the two bases is represented by segment AB. Figure 2 reflects a representation of the model of the loss-of-strength gradient and the spheres of influence of the armed forces, according to the authors' conception.

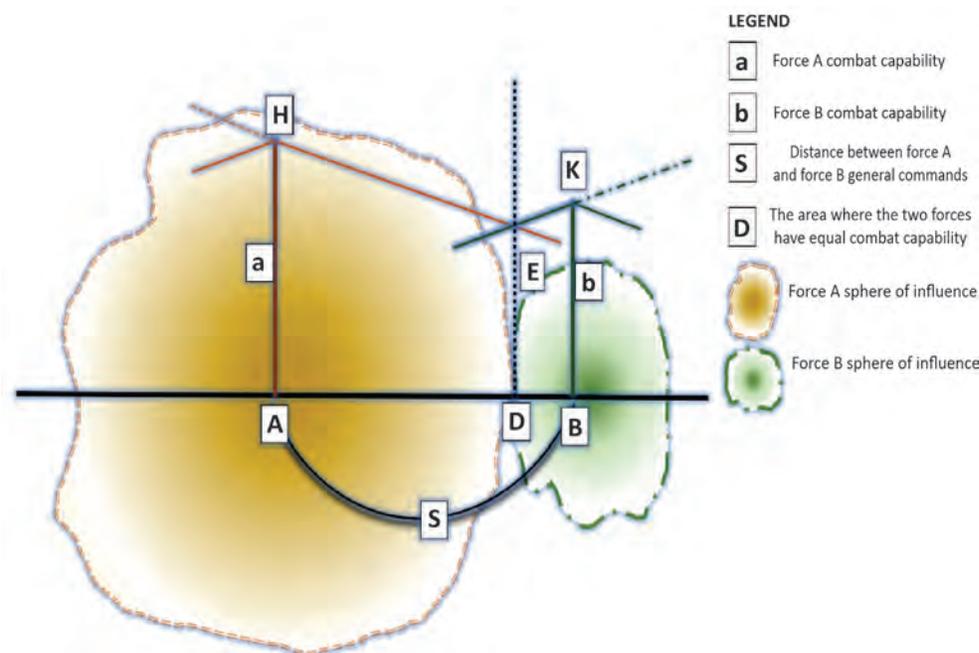


Figure 2: Spheres of influence and the gradient of combat capability loss, according to theory (authors' design)

Next, we will address the combat capability of each force, noting that the base garrison records a maximum level of combat capability ($AH=a$, $BK=b$). For a clear understanding of the term, we define combat capability as “the state of a force at a given moment, a combination of moral, physical, and conceptual aspects [...], the result of the force generation process – doctrine, training and evaluation, equipment, morale, and other factors” (F.T.-1, *Doctrine for Ground Forces Operations*, 2017, p. III–12). Since measuring this variable is especially difficult, only quantifiable elements such as personnel staffing, equipment, and supplies could be considered.

It can be observed that, as the distance between the base garrison and the deployment point of the forces increases, two phenomena occur simultaneously. The first phenomenon relates to the decrease in combat capability as the distance from the garrison grows, and the supply lines extend. The second phenomenon registers an increase in transport costs, directly proportional to the distance of deployment.

Referring to the first phenomenon, viability theory addresses the loss-of-strength gradient concerning the distance from the point of origin, in our case, the general command of the opposing forces. The reasoning behind the theory admits that a military force becomes weaker as it moves away from the originating garrison for several reasons, including the extension of resupply and evacuation routes, decreased efficiency of logistical support, and diminished morale of the troops.

To summarize the mentioned theoretical aspects, we can emphasize that in Russian military doctrine, the logistical concept provides the necessary capabilities to support the armed forces, theories from the field of economics highlight the importance of material supply for expeditionary operations, and the military transport system heavily relies on the railway network.

EXECUTION OF LOGISTICAL SUPPORT FOR RUSSIAN TROOPS

If we draw an analogy between Boulding's theories and the invasion of Ukraine on 24 February 2022, we can observe that the effect of distance on logistical efficiency remains relevant. As previously mentioned, expeditionary operations require robust logistics to compensate for the drawbacks imposed by extended lines of communication. However, in practice, it has been demonstrated that the current Russian military logistical system is not organized, trained, or equipped to provide the necessary expeditionary logistics for operational success.

A series of errors led to the inefficiency of logistical support for Russian troops. At the operational level, planners believed that a rapid attack with minimal material losses would lead to territorial gains without imposing the need for resupply.

Furthermore, to achieve the element of surprise, Russian decision-makers kept the troop deployment plan secret, including from logistics planners. According to studies published by military research institutes, Moscow likely expected Kyiv to capitulate within three days (Watling, Reynolds, 2022). It was the basis for the decision that combat forces would carry supplies for only five days of fighting, as stipulated by Russian armed forces logistics doctrine. As is known, Russian troops withdrew from near Kyiv by 2 April 2022, with enormous losses.

Various centres and research institutes have studied the causes of logistical failure in the battle for Kyiv. The study on *“The Failures of Russian Logistical Support in the Ukraine Conflict”* is relevant as it clarifies the causes of the disruption of logistical support for Russian forces in the initial weeks of the operation conducted in Ukraine (Martin, Barnett, McCarthy, 2023). Logistics convoys loaded with necessary materials to resupply Russian armed forces were blocked by actions of the Ukrainian armed forces.

The causes that led to dysfunctions in logistical support were numerous: the extensive size of communication lines, the use of unsecured communication networks, the destruction of bridges and railways, and the preference for artillery support over air support.

The communication lines became excessively extended due to the increased pace of the assault forces. Russian assault forces, which did not encounter significant resistance from Ukrainian defenders, successfully exploited the element of surprise. These forces advanced near Kyiv, making the resupply of ammunition and fuel the main issue for logistics planners. According to the doctrine of the Armed Forces of the Russian Federation, the logistics support brigade (MTO is the Russian acronym for this brigade) does not possess sufficient transport capability to meet logistical requirements at distances greater than 160 kilometres from railway supply sources (Hugos, Salo, Kuhns, Hazen, 2022).

The communication lines used to transmit orders or requests for logistical support were not secured. It worked to the advantage of Ukrainian forces, who were able to intercept conversations and identify the positions of Russian forces, as well as the routes of the convoys. Logistics convoys became targets for Ukrainian attacks, resulting in human and material losses. Thus, Russian resupply lines were disrupted.

Another factor contributing to failures in logistics planning was the use of unsecured communication networks for transmitting logistical orders. The assault forces acted swiftly, and the rapid pace of the offensive operation made it impossible to maintain radio connections. Therefore, communication of orders was conducted

through devices that were easily intercepted by Ukrainian soldiers. As a result, the Russian supply chain was interrupted due to Ukrainian attacks on logistics convoys. The destruction of bridges and railways (Ti, Kinsey, 2023), as well as the selective flooding of the terrain, hindered transportation efforts (Spencer, Collins, 2022). In this case, Ukrainian forces applied a lesson learned from the Second Battle of Fallujah in 2004 (Ib.). At that time, the US troops were surprised by flooding caused by a destroyed dam, and the force commander had to change the essential mission to reduce the flooding. In Ukraine’s case, knowledge of urban infrastructure was crucial for the success of the adopted tactics.

Fire support was provided more by ground artillery than by air support. Since the Russian armed forces did not have the capability to achieve air superiority, and due to the lack of training of aviation pilots, air support during the battle for Kyiv was minimized. Thus, the main effort for fire support fell to ground artillery, which further burdened the logistics effort in resupplying artillery ammunition.

One reason for the poor performance of the Russian armed forces during the invasion of Ukraine was the unsatisfactory supply of material items and the low level of logistical support for Russian troops. There were numerous instances of interruptions in the operation of Russian military equipment due to a lack of fuel and ammunition, leaving personnel without food and heating. The result of such poor logistical support was low morale among soldiers and their inability to fulfil assigned combat tasks during engagements with Ukrainian forces.

In summary, we can conclude that the logistical support forces were undersized to sustain the effort of supplying troops along extended and unsecured communication lines, and the troops did not have an adequate number of supplies to fulfil their military objectives.

CONCLUSIONS

From the perspective presented, we believe that the poor application of Russian doctrine in providing logistical support contributed to the operational failure of Russian assault forces in the battle for Kyiv. The operation was planned so that the attacking forces could benefit from the element of surprise to gain ground and exploit the initiative. Initially, the execution of the plan proceeded as expected; however, it later proved that some aspects were not sufficiently planned. Thus, the rapid advance of Russian armed forces into Ukrainian territory led to an unacceptable extension of supply lines. Additionally, to achieve surprise, the attack plan was kept secret, and logistics planners did not have adequate information for supply allocation according to Russian logistics support doctrine. Furthermore,

the rapid pace of the operation resulted in deficiencies in communication systems, with messages transmitted via unsecured lines intercepted by Ukrainian armed forces, who then attacked Russian resupply convoys.

In concluding this study, we believe that the following theoretical aspects were not effectively applied to the logistical support of assault troops:

❖ According to Russian doctrine, material-technical support structures (MTO) have the primary task of maintaining combat readiness and the combat capability of troops through the efficient use of military command and control bodies, as well as MTO forces and means. In practice, Russian operational plans were kept secret from most planning staff, including logisticians. For this reason, logistical estimates were based on insufficient planning hypotheses, and combat forces carried limited amounts of supplies. The logistics effort was further strained by the needs for artillery ammunition supply, as fire support for the operation was not realized through aviation, except to a minor extent.

❖ According to the theory of the loss-of-strength gradient, as the distance of troop deployment from the base garrison increases, the combat capability of that force will decrease. Long distances of deployment imply extended supply lines that require additional protection. In the case of Russian troops, combat capability was diminished due to the lack of prior preparation of logistic structures for the resupply of ammunition and fuel. Moreover, Russian supply convoys fell into ambushes organized by Ukrainian forces, as supply line security was not established.

❖ The military transport system of the Russian Federation heavily relies on the railway network; however, for resupply, logistics focused only on road networks within Ukrainian territory. The routes used to supply approximately 15,000-20,000 soldiers were insufficient and undersized. In practice, logistical support forces failed to supply troops adequately, primarily due to the extending communication lines and a lack of access to railway infrastructure that is vital for ensuring material supplies.

We can observe that avoiding errors in the application of doctrine could have led to a different outcome in the battle for Kyiv. The lesson we consider important to be retained is the timely identification of support requirements and realistic logistical estimates, particularly through adherence to relevant doctrines and theories in the logistics field.

BIBLIOGRAPHY:

1. Berkowitz, B., Galocha, A. (2022). *Why the Russian military is bogged down by logistics in Ukraine*. *The Washington Post*, <https://www.washingtonpost.com/world/2022/03/30/russia-military-logistics-supply-chain/>, retrieved on 22 May 2024.

2. Boulding, K.E. (1988). *Conflict and defense: A general theory*. University Press of America.
3. Cunningham, A. (2023). *The Complexity of the Supply and Logistics System of the U.S. Army and the Need for Automation*.
4. *Doctrina logisticii întrunite a Armatei României/Romanian Armed Forces Joint Logistics Doctrine* (2023).
5. *F.T.-1, Doctrina operațiilor forțelor terestre/Doctrine for Ground Forces Operations* (2017).
6. Grau, L.W., Bartles, C.K. (2016). *The Russian Way of War: Force Structure, Tactics, and Modernization of the Russian Ground Forces*. Foreign Military Studies Office.
7. Helper, S., Soltas, E. (2021). *Why the Pandemic Has Disrupted Supply Chains*. The White House, <https://www.whitehouse.gov/cea/written-materials/2021/06/17/why-the-pandemic-has-disrupted-supply-chains/>, retrieved on 22 June 2024.
8. Hugos, M., Salo, E., Kuhns, R., Hazen, B. (9 August 2022). Logistics Determine Your Destiny: What Russia's Invasion is (Re)Teaching us about Contested Logistics. *Modern War Institute*, <https://mwi.westpoint.edu/logistics-determine-your-destiny-what-russias-invasion-is-reteaching-us-about-contested-logistics/>, retrieved on 31 August 2024.
9. *Joint Operations, Joint Publication 3-0*. (2017).
10. Jones, S.G. (2022). *Russia's ill-Fated Invasion of Ukraine*, <https://apo.org.au/node/318095>, retrieved on 22 June 2024.
11. Martin, B., Barnett, D.S., McCarthy, D. (2023). *Russian Logistics and Sustainment Failures in the Ukraine Conflict: Status as of January 1, 2023*. RAND Corporation, <https://doi.org/10.7249/RR2023-1>, retrieved on 12 May 2024.
12. Milevski, L. (2022). *Russian Logistics and Forward Urban Defense in the Baltic States*.
13. Nistorescu, C.V. (2022). *Bătălia Kievului – considerații privind desfășurarea operațiilor militare la nivel tactic*. In *Gândirea militară românească*, 4/2022, pp.130-155, <https://doi.org/10.55535/GMR.2022.4.07>, retrieved on 22 August 2024.
14. Skoglund, P., Listou, T., Ekström, T. (2022). *Russian Logistics in the Ukrainian War: Can Operational Failures be Attributed to logistics? Scandinavian Journal of Military Studies*, 5(1), pp. 99-110, <https://doi.org/10.31374/sjms.158>, retrieved on 22 June 2024.
15. Spencer, J., Collins, L. (1 July 2022). *Waterworld: How Ukraine Flooded Three Rivers to Help Save Kyiv*. *Modern War Institute*, <https://mwi.westpoint.edu/waterworld-how-ukraine-flooded-three-rivers-to-help-save-kyiv/>, retrieved on 22 August 2024.
16. Ti, R., Kinsey, C. (2023). *Lessons from the Russo-Ukrainian conflict: The primacy of logistics over strategy*. *Defence Studies*, 23(3), pp. 381-398, <https://doi.org/10.1080/14702436.2023.2238613>, retrieved on 21 August 2024.
17. Vershinin, A. (2022). *Lessons From the Battle for Kyiv*. *Russia Matters*, <https://www.russiamatters.org/analysis/lessons-battle-kyiv>, retrieved on 22 June 2024.
18. Watling, J., Reynolds, N. (2022). *Operation Z: The Death Throes of an Imperial Delusion*.