

Operational Logistics in Russia - Ukraine Conflict and Lessons Learnt

Col Vinod Kumar, SM, PSc

“Leaders win through logistics. Vision, sure. Strategy, yes. But when you go to war, you need to have both toilet paper and bullets at the right place at the right time. In other words, you must win through superior logistics.”

– Tom Peters

Abstract

A warrior with shining armour & clinging sword in Alexandra era, an army of soldiers led by a cavalry, a wall of elephants during era of Mughals, mechanized formations generating dusty clouds in deserts in "Op Iraqi Freedom", images of Bofors blitzing during Kargil War, INS Vikrant like large water platforms maneuvering in Indian Ocean and swift & agile Sukhoi 30 during various military exercises and now latest images of missiles, lethal drones flying & 7000 Paratroopers of Russian Army heading towards Kyiv are enough visuals to generate excitement to viewers and send shivers in the spine of an enemy commander sitting at a far distance is the display of combat military intentions. However these actions are only possible due to the unseen men and women working 24x7 known as Military Logisticians. Russians as superpower of cold war era and till last decade only country to directly challenge the hegemony of USA/NATO. However the recent developments in Russia-Ukraine conflict tell a different story. On 24 Feb 2022 Russia launched military offensive in to Ukraine and it was assumed that with blitzkrieg Ukrainians did not stand a chance to even hold defences for 24 hours. Today we are almost completing nine months of offensive and Ukrainians are on counteroffensive to regain the initial lost territories. What went wrong which created the mismatch in the desired operational plan of the Russians? Answer lies in analysis of Military Logistics. An operational plan is the final blow to achieve the desired goal however the required strength is produced by the logistics. Historically it's a proven fact that sound logistics plan is the key to a successful military operation and any loose nut if goes unnoticed we have an irreversible operational or tactical situation leading to enemy offensive. This article is an attempt to analyze role of Russian Logisticians in ongoing conflict and lessons learnt for future scenarios.

Key words – Operational Logistics, Russia- Ukraine conflict, Military Operational Logistics, Lessons learnt from Russia- Ukraine conflict, Operational Plan & Military Logistics

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I. Background.

The annexation of Crimea by Russia in yr 2014 laid the foundation of a larger conflict in Europe since WW II. Numerous peace talks have taken place between Ukraine, NATO, US & Russia in past eight years to resolve the issue, but no success was achieved. President Vladimir Putin had already started prep for a larger conflict by imposing the most advance form of hybrid warfare in Donbass region since 2014 and was looking for an opportune time to thwart eastward expansion of NATO. Putin's pushback is not surprising as the West had been moving into Russia's backyard and threatening its core strategic interests, a point Putin made emphatically and repeatedly. On February 24, 2022, Russia began the "special military operation" to demilitarize and "denazify" Ukraine. From the outside, it seemed as if the Kremlin planned this to be a short blitzkrieg type of operation in which Russian forces would capture and depose the president and the Ukrainian leadership within a few days. The war started on two fronts with what seemed to be two different operational objectives. On the north-west, the objective was to capture Kyiv; in the east and south-east, the aim was to capture the Donbas region and establish a land-corridor between the Donbas and Crimea. Today we are almost completing nine months and conflict is still on. The media experts, strategy planners and Military strategists across the globe has blamed the Russian Military Logisticians for miscalculation and dragging of the conflict to this stage where Ukraine Armed forces have now gone for the counter offensive. Considering the background the aim of this paper is to analyze the concept of operational logistics of the Russian Army as seen in the ongoing conflict and draw lessons.

Strategically Russia has been highly dependent on three Generals or Gs as they are called ie General Food & grains, General Fuel & Gas and the most feared General the General Winters. Strategists around the globe have already felt the impact of short supply of food grains and gas. These two commodities have already

created upward trend of inflation in all markets and result is continuously still being felt. Entire Europe is now fearing and praying for normal situation before arrival of the General Winters. All these three aspects ie grains, fuel and winters or terrain/climate are connected with logistics. In addition some strategist have questioned the operational plan or planned reach of the Russian forces and subsequent logistics pause. Military operational plan and operational logistics are interrelated. Given the importance of this so called “Special Military Operation” by the Russia it is safe to assume that full and detailed logistics planning in support of the offensive by the Russians would have been in place. However as a counter argument to the point of Russians halting their advance and retreating midway it is argued that Ukraine is a vast country and overrunning and capturing a country is near impossible in today’s geopolitics scenarios given the connected issues of International treaties, refugees’ management, food crisis and the requirement of general management as all these aspects become the prime responsibility of the occupying power. Hence strategically & operationally Russians might not have overlooked these aspects. Since scope of this paper is to analyze the functionality of operational logistics of Russia, accordingly contents would be restricted to operational and tactical logistics support in various operational phases and areas. India faces two front threat from its Northern and Western neighbours and basics of military logistics across all militaries remain the same, accordingly its pertinent for Military logisticians to learn from the conflict to overcome the visualized negative scenarios.

Aim. The aim of this paper is to analyze operational logistics of Russian Military in ongoing Russian – Ukraine conflict and draw lessons.

Scope. The paper has been covered into following parts:-

- Russia’s War Objectives
- Military Logistics in support of Operational Plan
- Logistics failure a myth or reality
- Lessons learnt and way ahead

Russia’s War Objectives. Ukraine was a cornerstone of the Soviet Union, the archrival of the United States during the Cold War. Behind only Russia, it was the second-most-populous and -powerful of the fifteen Soviet republics, home to much of the union’s agricultural production, defense industries, and military, including the Black Sea Fleet and some of the nuclear arsenal. Ukraine was so vital to the union that its decision to sever ties in 1991 proved to be a coup de grace for the ailing superpower. With continuous knocking of NATO on its doors Russia was looking for political alliance with Ukraine guarantying conditional transparent borders. However these requirements were turned down by the Ukraine leadership and repeated insistence by Mr Zelensky to join NATO membership further fuelled the issue.

- **Strategic Objectives.** Russia has formally put following requirements:-
 - Recognition of Crimea as Russian territory.
 - Agree to Donetsk and Luhansk peoples’ republics as Sovereign states.
 - Ukraine to be a neutral state with non NATO status
- **Military Objectives.** To achieve the highlighted strategic objectives Russians have launched “Special Military Operations” or offensive into Ukraine on 24 Feb 2024. Overall military objectives could be summarized as under:-
 - Threaten Kyiv, isolate Donbas and coastline along Black Sea.
 - To capture Kharkiv
 - Trigger collapse of Ukrainian Govt and install pro Russian Govt.
- **Operational Execution Plan.** The broad execution strategy was as under:-
 - Swift decapitation attack along the broader front
 - Advance of dispersed troops all across the border including threaten centre of gravity.
 - Achieve complete element of surprise.
 - Combined air assault and ground attack in Donbas region.
 - Sound and well rehearsed logistics support
- **Russian Outline Plan for Invasion.** Considering the pace of operations and execution pattern in military parlance following appears the operational outline plan (map source BBC website):-



- **Phase 1**
 - Take Hostmeal(Antonov) air field and Kyiv in initial days with 7000 paratroopers(special forces) thus threatening Centre of Gravity forcing enemy to withdraw troops from front line to defend the rear areas.
 - Air and artillery (long range missiles) all across Ukraine to disrupt movement of logistics, Dual Task Forces (DTFs) thus crippling morale and will to fight.
 - Result- Desired result not achieved though in initial days Ukrainian forces were caught off guard as Russians achieved complete surprise with daredevil attempt to capture the Antonov Air field almost 200 kms from Belarus- Ukraine border.
- **Phase 2.**
 - Deployment of Armour to encircle Kyiv and Kharkiv.
 - Parallel military offensive from North and South.
 - Result – Progress of operations has not been as per the initial success due to unknown reasons.
- **Phase 3.** Till the time the operational narrative is written and well documented following seems to be the overall operational plan:-
 - Annex Novorossiya – Ukrainian land from Donbas to Tranistria
 - Result – All four regions ie Donetsk, Lugansk, Kherson and Zaporizhia have been placed under Russian Martial Law status wef 20 Oct 2022 (as shown on BBC website map).



Source: Institute for the Study of War (21:00 GMT, 09 October)

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Military Logistics in support of Operational Plan

General Logistics Philosophy. Like any other army in the world the Russians also follow the chain system of maintenance. Military logistics create and sustain military capability to ensure that the military supply chain connects the industrial base to the soldier in the field to achieve the desired results. Military Logistics are conducted at strategic, operational, and tactical levels. At the strategic level, defence logistics is about decisions ensuring sufficient national industrial capacity to cover the needs of the armed forces, adequate national preparedness, and access to strategic resources from other nations. Strategic logistics determine which operations are possible to execute and the tempo at which they may be executed. A trustworthy logistics base is an integral part of a nation's deterrence. Military logistics at the operational and tactical levels are a matter of both designing and establishing supply networks, and moving and sustaining combat units in the area of operation. Military logistics ensure that the material elements of combat capability merge at the right place and time and in the right configuration to be useful. The military forces nations can deploy to an operational theatre, the time it will take to deliver that force, the scale and scope of forces nations can support once deployed, and the tempo of operations, are consequently derived from logistics capabilities.

At the operational level, the logisticians plan, prioritize and distribute resources to logistics hubs, from where resources are transferred to the tactical logistics units. These units then support the operation by distributing supplies and maintenance to the combat units – that is, by ensuring that the right supplies reach the right place and recipient, at the right time, in the right quantity and in the right condition. In modern warfare Armed forces can support their deployed military units in three ways. Military units can bring supplies with them, logistics units can establish supply lines from depots in safe areas to the fighting forces, or the deployed units can “live off the land” by procuring locally in the area of operations. The overall logistics philosophy works out around these three aspects in support of an operation.

Russian Logistics Concept. Russian army follows the concept of replace the formation rather than men implying an “echelon principle,” according to which one echelon fought while another was ready to be deployed to the frontline when the first echelon was exhausted. Once replaced, the first echelon would reorganize and be refitted with personnel, equipment, and consumables to again be combat-ready. The echelon principles build on army groups supported by one or more Material Technical Support brigades (MTS or MTO as Russian

acronym). Presently in open sources Russian army has 10 MTS Brigades. Each MTS Brigade has approx 400 trucks. The fighting units have some organic capacity to retrieve supplies from the rear but depend on the MTS for strategic and operational logistics. The MTO brigades support the entire front-line force, moving supplies from railhead depots to the battlefield. The main means of transportation is the railway system; fuel and water are carried through pipelines. The MTS brigades include units that build and maintain railways and pipelines to support the forward-marching forces. Modern Russia does not have the capability to mobilize and sustain a multi-echelon force for a prolonged war, which means that deployed forces do not have a second echelon. There is only one opportunity to secure victory.

The Russian Armed Forces operational concept, inherited from the Soviet Union, was modernized during the major transformation in 2009. In parallel, Russia replaced the obsolete Soviet logistics system with a leaner one, involving significant downsizing and outsourcing however it largely remained untested in combat operations. Despite foreseeing an improved logistics capability a recent assessment of 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 in major large scale offensive beyond its borders.

As throughout Russian society more generally, military planning also follows a strict hierarchical, top-down, structure. The Force Commander chooses the course of action (COA), and the commander's staff details how to proceed with this COA. According to foreign experts on the subjects, the military staffs are smaller than those of NATO. The 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 hence standardized and largely follow the same principles as they did in the Soviet era thus restricting the principle of flexibility.

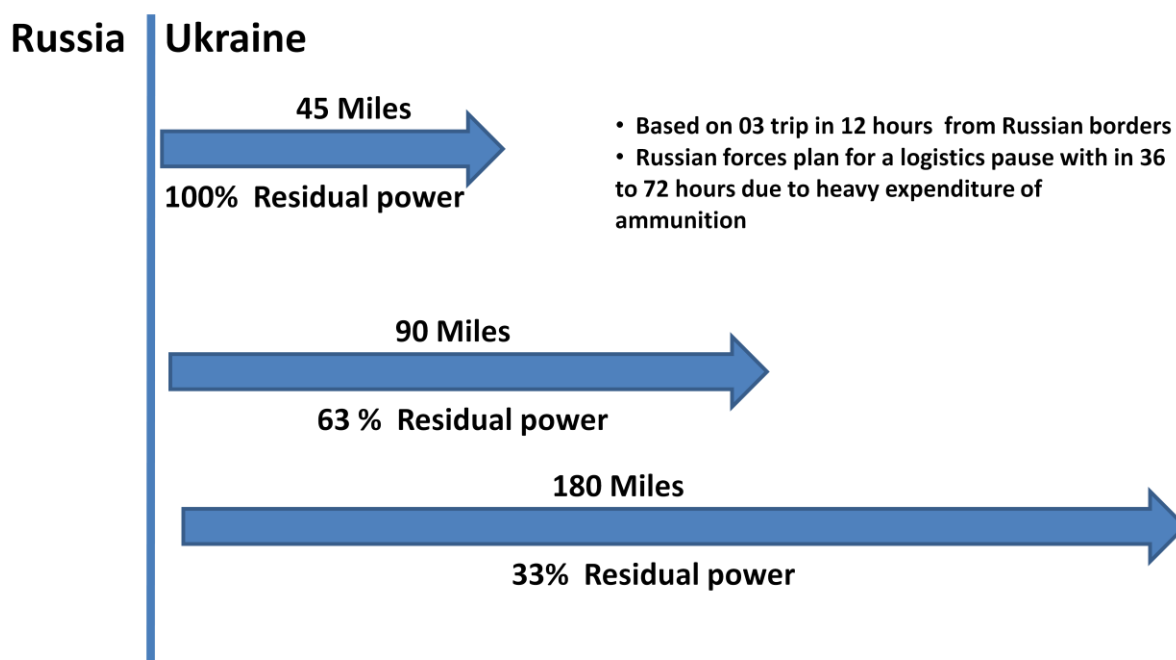
Logistics Preparations for Ukraine Offensive. Military exercises and operations require logistics. Russian exercises conducted along the Ukrainian border before the war are certainly pertinent to this analysis, touching on logistical preparedness for the invasion that was subsequently launched. In Jul –Aug 2021 the Russian Army conducted a large scale military exercise named as ZAPAD-21 on Belarus- Ukraine border. The Russian build-up along the border went on for a long time. As the spring exercises of 2021 concluded, the Russians left a substantial amount of equipment in the exercise areas close to Ukraine. When the exercise activities resumed as the joint Russian-Belarusian exercise, the forces supplemented these with more equipment. According to the Russian Ministry of Defence, around 200,000 servicemen participated in the different exercises in Russia and Belarus. Such large-scale exercises require a detailed exercise plan, including a logistics plan for supply, maintenance, medical services, and transportation. For Zapad-2021, logistics units were deployed well in advance of the exercise itself, with preparatory activities already taking place in July and August of 2021. If the Zapad logistics plan only covered the exercise and not the coming war, the final phase in the plan would be the repatriation of materiel & personnel and the refurbishment and maintenance of materiel upon return to home bases. To avoid a massive surge of supplies coming into the exercise areas after end of exercise, the Russian logisticians would plan and carry out the logistics activities to culminate as the exercise ended. According to open intelligence reports such as those published by the United States and NATO, the exercises were indeed preparations for an invasion.

Did Logisticians Really Fail ? It has been highlighted since beginning that the Russians were logistically not prepared to support the offensive deep into Ukraine. For that matter any power in the world in today's scenario will find it near impossible due to various already highlighted reasons in the beginning. As per the ground position as on 20 Oct 2022 it is evident that overrunning the Ukraine was never ambition of Russian leadership. Russians were well prepared for the offensive as they have gone deep into the planning phase. This statement gets supported with the culmination philosophy of Russian Logistics. Russians since their logistics are sound till own frontiers always plan for logistics culmination or pause for operations beyond their borders. Every military logistician who has been following the conflict will agree to the fact that logistics pause was well planned in advance. Following facts merit attention.

- Russia has an extent of approx 6000 miles from one end to another end and its forces are deployed all around due to the NATO expansion.
- Major dependency as already highlighted for logistics push system is on railways and well laid out pipelines from hinterland depots, factories and installations to forward bases upto Brigade Defended Areas.
- These wide railway and pipelines are a network of former Soviet era passing into even in Ukraine.
- Accordingly beyond own borders these assets of supply chain are vulnerable to enemy actions in the eventuality of a conflict.

Based on the above facts let's take a look on the ability of the Russian Transport Corps or transport branch of MTS Brigade. It is called as Truck Logistics Support which is mix of Army and civil transport fleet. In Ukraine and Baltik nations border roads have limitations of mobility. Accordingly Russian army has foreseeable

problem while planning deep offensive operations and accordingly considers logistics culmination or pause based on the penetration of advancing forces and capability of follow up logistics echelons as there is always going to be a speed mismatch between the two.



- Above data indicates that logistics pause after initial three days of war was well anticipated

Russian Logistics Limitations & they Knew it. Russia for many decades avoided staging large armies long distances from its own borders. Moscow’s security concerns were along its periphery. So while the U.S. military—which usually fights overseas—developed its logistical capabilities and capacity, the Russian military devoted proportionally more of its own resources to combat forces. Tanks. Warplanes. Submarines, however the logistics couldn’t get the desired focus due to the MTS concept and overlying on railways and pipelines. Summarized limitations are as under:-

- **Heavy Dependence on Railways & Pipelines.** Russia is vast and its roads are poor compared to roads in Western countries. That helps to explain why the country, and its army, leans so heavily on rail for logistics. State-owned Russian Railways owns 20,000 of the country’s 21,000 locomotives. Private firms own most of the roughly 1.2 million freight cars, including 66,000 flat cars for hauling vehicles. Those 66,000 cars, handled by unique army railway troop brigades, are “more than enough to transport the equipment of the entire Russian ground force units,”. However railheads aren’t always close to the front line. To reach battalions rolling west toward Kiev, supplies must travel scores or hundreds of miles by road. That’s where the Russian army’s logistics are weakest. “The Russian army does not have enough trucks to meet its logistic requirement more than 90 miles beyond supply dumps. The Russian army has 10 “material-technical support” brigades. Each operates around 400 trucks. Even if every support brigade mobilized and all of their vehicles remained operational throughout a campaign, the available trucks wouldn’t stretch very far.
- **Operational Plan v/s Logistics.** If logistics cannot keep up with the operational pace, logistics culmination occurs. Logistics culmination, signifying that logistical resources are exhausted, happens for different reasons. As the area of operation grows geographically, more transport resources are required to cover greater transportation distances. If the pace of operations is higher than anticipated, logistics may struggle to keep pace. Operation Desert Storm in Kuwait clearly demonstrated this in 1991, when the U.S.-led coalition halted operations after 100 hours as operational speed exceeded the logistics capabilities. One can easily relate the same with initial blitzkrieg launched by Russians and subsequent logistics pause after three days itself.
- **Hierarchy v/s Flexibility of Planning.** 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. Russian operational planning is conducted on a higher hierarchical level than that of logistical planning. Based on the Force Commander’s chosen COA, logisticians plan the volumes and distribution of the different resources needed. While the invasion plan must have been known beforehand at some levels in the command chain, logistics may

not have been involved. If the detailed logistics plans for Zapad-2021 were made merely for the exercise, continuing into a war would definitely create a logistics vacuum. Based on the reported logistical problems in the early phase of the war, it thus seems that the Russian logisticians had planned for the exercise alone, with little or limited insight into the projected logistics vacuum. This had a negative impact on the Russian military capability in the first phase of the war.

- **Vast Distances to Key Objectives.** The Russians assumed they would quickly capture the capital city of Kyiv and force President Volodymyr Zelensky out of power. Whatever the strategy, that outcome did not happen, and Russia has been bedeviled by an inability to keep supplies flowing to troops in a longer ground war. After weeks of little success except in southeastern Ukraine, despite relentless shelling and thousands of military and civilian casualties, Moscow said during peace negotiations on Tuesday that it would “drastically reduce” military activity in the northern part of the country, near Kyiv and Chernihiv. Russia preferred to move troops and supply on railroads, and it was in the southeast after seizing Kherson and Melitopol and securing a crossing over the Dnieper River. But it didn’t control rail hubs such as Chernihiv in the north, and because the ground had been wet and muddy, Russian vehicles had to stick to roads. “Trucking takes a lot of time,” said Kofman, “and the tyranny of distance became really challenging because they were trying to push a large force down some fairly narrow roads.” And it was not just one trip. Supply trucks and other support vehicles had to constantly shuttle back and forth.

- **Combat to Support Mismatch.** Weapons and fighters in any ground invasion would not last long without the support of mechanics, medics, engineers, truck drivers, cooks and other crew. The needs of soldiers fighting a modern war are enormous. On average, each Russian soldier went through about 440 pounds of supplies a day, including food, fuel, ammunition, medical support and more. Russia has sent more than 150,000 troops into Ukraine, organized into various formations. The Russian army operated with fewer support soldiers than other militaries. About 150 of the 700 to 900 troops in one battalion tactical group could be considered support. Because this formation would have been an arm of a larger force in the area, they could have also expected help from other logistics units. But the ratio would have still not come close to that of the U.S. Army, which deploys about 10 support soldiers for every combat soldier.

- **Ignorance to Basics.** Trucks moving along sup lines need protection, especially if travel options have been narrowed to a few predictable roads. But early on, Russian troops didn’t execute the basics of convoy escort, which involves armoured vehicles and soldiers travelling with and defending vulnerable logistics vehicles. Some supply vehicles were left on their own, even after the Ukrainian military advised citizens on social media to attack un-armoured fuel trucks.

- **Scattered Command Structure.** The Russian command structure has been “confused at best”, head of Land Platforms and Weapons at defiant agency. It is not one structure, but four, coming from four different regions of Russia. “A single, unified chain of command makes life a lot simpler they had not got that.” Stark evidence of the faulty chain of command is that at least 15 senior Russian commanders, including seven Generals, had been killed, according to the Ukraine Defense Ministry. Typically, such high-ranking officers would not be anywhere near the front lines, but they’ve had to go further forward than normal to impose order and direct operations at the lower levels. Many Russian troops in the south appear to be professional soldiers who had been deployed in Crimea. But elsewhere, especially in the north, Russian forces appear to have many draftees who may be less motivated and less trained. In addition, it appears that orders for the invasion were kept secret from the rank and file. They did not tell the troops that they were actually being sent to invade Ukraine until very, very late in the game. “Troops who believed that they were on an exercise were going to take a very different approach to think about logistics than they were if they actually believed that they were being sent into a large war. Communication was further disrupted when, in the process of bombing cities such as Kharkiv, Russian forces destroyed cell towers needed by their own secure network. They were forced to use unsecured lines that were easily intercepted. One Russian general was reportedly killed in an airstrike after the Ukrainians located him by his cell phone signal.

- **Shortage of Critical Supply.** Logistics problems were preventing Russia from effectively resupplying their forward troops with even basic essentials such as food and fuel. Some Russian soldiers had suffered frostbite because they lacked cold-weather gear. Some soldiers carried meals that expired in 2002, and it intercepted radio communications between troops outside Kyiv who said they needed food, water and fuel. CNN cited two “sources familiar with the matter” who said Russia had asked China for rations. And plenty of videos of soldiers looting were circulated, which was not uncommon for Russian troops in wartime.

- **Questionable Medical Care.** A vital aspect of military planning is how best to treat and transport wounded soldiers, ideally within the first hour after a trauma, there have been reports of inadequate medical support for Russian troops. Russia was not prepared to adequately support their soldiers in terms of their medical needs. NATO official estimated that between 7,000 and 15,000 Russian troops have been killed since the invasion began in late February, and many more have been wounded, Russia is pulling in reinforcements who are deployed elsewhere. The British Def ministry said Russia was hiring soldiers from the pro-Kremlin mercenary group Wagner.
- **Excessive Vehicle Breakdown.** Since the invasion began, Russia has lost more than 2,000 vehicles, including more than 300 tanks, according to reports. The Ukrainians destroyed and captured some, while others were abandoned. Some of the tanks were generations old, including a Soviet-era tank that first entered production more than 50 years ago.

Lessons Learnt & Way ahead. Importance of deep understanding of military history cannot be overemphasized. In ancient times, the survivor Commanders of the battle field carried with them valuable lessons learnt and fought the subsequent battles with better prep and panning. In past Century, World War I and II have provided immense learning for the military planners. Changing battle field scenario and graduating to multi domain operations has reduced the OODA (Observe, Orient, Decide & Act) loop and it necessitates highest level of operational readiness by nations at all times. Lessons learnt in one battle/ wars are generally gainfully utilized in subsequent wars by others, if analyzed and monitored closely. In the era of digitization with real time sharing of info across the world, the progress, outcome and various aspects of any conflict is known to the entire World within no time. It is therefore essential to analyze the takeaways from Russia-Ukraine war wrt logistics support for the Indian Armed forces. It's a scenario which has links to diplomacy, war fighting, economics, humanitarian affairs and much more. The theatre of war in East and Central Europe where the crisis is continuing, has seen hybrid conflict for the last eight years and a possible deterioration to the current situation was least expected. Few of the lessons learnt so far are enumerated in succeeding paras.

At Strategic Level.

- **Self Reliance (AtmaNirbhar Bharat).** While on one hand Russia remains India's biggest and time-tested supplier of military hardware, the US, the EU, and UK are all vital partners that India cannot afford to antagonize. India as a nation is developing at a fast pace. AtmaNirbhar Bharat pgme has paved the way for self-reliance of the nation. It is in the national interest that expeditious decisions and actions are taken to reduce import of weapon systems and equipment from other countries. Self reliance once developed completely will bolster the confidence of nation as a whole while taking important geopolitical decisions. In order to deal with the Chinese expansionism, adventurism on its own borders, and a South Asian region suddenly vacated by America's military presence in Afghanistan, India needs both the US and Russia to fend off a Chinese strategy and geo-economic threat in Asia. However, it is important to realize that when there is conflict between the two major powers, they have to fight heir battles alone. Hence, self-reliance is the key. Only when India attains true "Atmanirbharta" in arms, it will be able to look the world in the eyes.
- **Diverse Sources of Import.** India as a country must enter into agreement with multiple sources for its vital supply of weapons platforms and equipments till such time self reliance is not achieved in all spheres of tech, production and maintenance. Max reliability on one nation will restrict our flexibility in a situation like Russia-Ukraine war.
- **Information Warfare (IW).** Real time sharing of information brings clarity in the mind of own people and also defeats the propaganda machinery of the adversary. Intelligent uses of social media platforms will highlight own achievements and at the same time discredit those of adversaries. Timely and clear communication between President of Ukraine with his people has made a remarkable difference in the fighting of war by Ukraine. Indian Armed Forces must also develop the capability to effectively utilize the social media platforms for wider dissemination of our narratives and countering the propaganda or false negatives of our adversaries.
- **Cyber Security.** Automation of procedures has improved all facts of military operations and logistics. Advanced avionics, communication systems, guidance systems are being supported with enhanced logistics support systems. Attack by the adversary on the networks, servers, grids etc will disrupt the functioning of the armed forces. Cyber proofing of networks of Indian Armed forces is essential to protect against cyber attacks from the adversary.

- **Strategic Initiative & Exploiting Window of Opportunity.** President Putin has successfully demonstrated that nations should not compromise on core interests and maintain willingness to resort to military option shall diplomacy fails. World's economy struggling to emerge from Covid-19 pandemic, US/NATO's embarrassment after Afghanistan withdrawal including no appetite for involvement in another war due to domestic compulsions led to an almost perfect window of opportunity for military intervention in Ukraine. Such initiatives by own leadership or adversary to be kept in back of mind and logisticians to prepare for the same.
- **Responding to Hybrid Warfare.** At Strategic level, Russia's activities in eastern Ukraine provide a blueprint for future hybrid warfare in Kashmir valley. A key aspect of strategy was to capitalize on presence of significant numbers of ethnic Russians living in targeted country which acted as a pretext for military intervention and basis for formation of indigenous resistance forces. Such actions were taken by our Western adversary in 1965 War and possibility of the same cannot be ruled out. Therefore, own forces should be prepared to operate against a force comprising of irregulars, paramilitaries and regular Red /Yellow land units that are coordinating their activities.
- **Unpredictability.** Despite advanced and sophisticated tools of decision making, surveillance and war-gaming the prediction of such an eventuality failed. The US and France were two powers who did warn of an impending invasion but none could read fully into President Putin's mind. Accordingly it's important that the military planners and logisticians remain updated with the happenings of the region and prepare for all eventualities which may knock the door.
- **Coordination between Operations & Logistics.** Exercise ZAPAD 21 was a major military exercise carried out by the Russian & Belarusian joint forces with detailed logistics planning. However it seems that mismatch or lack of coordination between operations and logistics planners led to initial setback. Accordingly updated awareness to absolute coordination between all the planners and support services is the key to any successful military operation.

At Operational Level.

- **Morale and Motivation.** Leadership and morale of the troops are deciding factors for outcome of any war. Confidence and motivation instilled by dynamic leaders (like Mr Zelensky) has resonated a sense of belongingness in every citizen of the country. Cohesion and trust developed in the hierarchy of Indian Armed Forces will be further strengthened by the bold decisions taken by our leaders. Esprit-de-corps of Indian Armed forces has surmounted challenges in previous wars and will continue to do so in future as well.
- **Importance of Air and Missile Defence** Ukraine's failure to intercept almost 99% of barrage of ballistic and cruise missiles led to heavy losses at Command, Control & Communication (C3I) centers, airfields, ammunition & logistics depots, etc severely limiting its combat fighting capability. Hence there is a requirement to integrate the air defence umbrella cover encompassing all logistics and control nodes to avoid the damage likely to be caused by the en rocket or missile barrage.
- **Offensive Cyber Capability.** The invasion was also carried out in cyber domain to disrupt Communication Centers and followed by cyber attack to cripple civil infrastructure such as power stations, banks, internet services etc. Thus led to severe confusion and panic among gen population that war had already been lost by Ukraine. Such scenario in Indian parlance will disrupt the logistics chain and ultimately affect the morale and will to fight. Accordingly it's essential that counter, counter-counter measures are in place well in advance.
- **Propaganda/ Information Warfare.** Russia has noted the importance of public opinion in Russia, Ukraine, European powers and US & aligned its media machinery to achieve desired outcomes. Moscow has had a consistent justification for its involvement that is to protect ethnic Russian speaking citizens under assault from an illegitimate Govt in Kyiv. Even after invasion, Russia continues to sell its story to world audience to improve chances of op success. Such theory was well practiced by Pak and China against us in past conflicts. Accordingly it's essential that our machinery is well geared up to counter such propagandas and public is given the correct and required narrative.
- **Use of Special Forces & Attack Helicopters/Drones.** The Russians forces extensively used paratroopers/ Heli-borne forces in conjunction with Attack Helpters to capture key airfields/ terrain features such as Chernobyl Nuc Power plant, Hostomel Airfield to tie down enemy reserves and also to induct more ground

forces to invest Centre of Gravity (CoG) Kyiv at the earliest. Now extensive use of drones by Russians has completely crippled the Ukrainian defences. Modern techniques and assets are the need of the hour to prepare our offensive and defensive plans.

- **Logistics Veto of Operational Plan.** Russia's invasion of Ukraine has gone slower than many Western analysts anticipated. In some areas, Russian forces advanced upto 120 miles in the first two days before coming to a halt. In other areas, especially around Kharkiv, the Russian offensive failed right away. While some delays are the result of successful Ukrainian resistance, especially around Kharkiv, others are the result of logistics challenges encountered by the Russian Army. Keeping a modern military supplied with fuel and ammunition is always a major challenge, especially when launching deep offensive operations that stretch supply lines. Even the US Army had to have an operational pause during "op Iraqi Freedom" in 2003 due to logistics shortfalls and tank shortages. The Russian military is no exception. Formulation of operational plans must be deliberate, meticulous and should be realistic while considering available resources, time lines for various phases of operation and re-supply mechanism of forward troops. To avoid a logistics pause it's essential that realignment, rebalancing and readjustment of logistics is well planned and operational reach is decided with logistics support so to have a contingency plan in case of counter offensive by the en.
- **Vulnerabilities of Logistics Echelons.** Mil strategists over a period of time have predicted future wars to be short and intense. The operational plan and its logistics support plans have been tailor made to address contingencies of a short war. Given the type of capabilities existing with our adversaries it would be prudent to be ready for the long haul in any contingency. Nations at war have a different mindset and their populations can adapt themselves to very little resources just as the Ukrainians are doing. This means creating the means for our own war stamina. There is no doubt that our strategic confidence is high, especially after the successful crash build-up of manpower and logistics resources in Ladakh in a period of eight weeks to mirror China. We should build on this and identify all vulnerabilities which could dilute war stamina.

At Tactical Level

- **Defence against Air Raids.** Underground metros/structures are major shelters to act as logistics hubs well defended against air attacks and need to be constructed in major town/cities.
- **Civil Defence Procedures.** Civil defence procedures including blackouts, basic military training and trench digging should be taught at colleges and practice regularly.
- **Importance of fire & forget Anti-Tank & Air Defence Missiles.** Ukrainian forces extensively used short range Anti-Tank and Stinger Air Defence missiles to inflict heavy casualties on advancing Russian mechanized columns/ Attack helicopters which significantly slowed down advance of Russian forces.
- **Flexibility in Logistics Support.** Logistics support systems of the field forces must be designed in a manner that change in op plan either due to enemy action on own decisions or own design of battle, is supported logistically for ensuring achieving desired end state. Rapidly changing situations in the battle field necessitates altering of operational plans. Logistics support system must be flexible enough to cater for all contingencies. In Russia-Ukraine war, numerous predictions were made but actual manifestation of the war is different from all those predictions.

II. Conclusion

The size, scale, and scope of the military failures Russia has suffered during its war in Ukraine have surprised many Western observers. Russia's invasion has exposed multiple systemic deficiencies in its military, which appear to be substantial and to extend across every Russian joint combat function. A leading cause of its operational failures has been the critical deficiencies apparent in Russia's military logistic support. The inadequacy of Russia's military logistic system has consequently been a major factor in its inability to achieve its war aims. Till the time operational design and objectives don't appear in open domain one will not come to know the exact causes of the Russian setback, however with initial deliberations and analysis of material available it's safe to assume that there remained a gap between the operational desire and logistics reach in the Russian plan. Though the deep objective conflicts in Indian subcontinent given the nuclear threshold are unlikely however military logisticians to be prepared in conjunction with the operational desire for offensive and defensive plans. In the last an Integrated Military logistics plan to have incorporation of civil and military administration and infrastructure. Military logistics to form part of Govt overall New National Logistics Policy 2022 with integration of local resources, preparation of civil resources data bank and rehearsing of the

same during annual military exercises.

Data Availability Statement -The author confirms that the data supporting the findings of this study are available within the article and under mentioned references along with its supplementary materials.

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