CLAWS SEMINAR REPORT

JULY 2015 SEMINAR REPORT # 7

National Seminar on Military Logistics: Challenges and Way Forward

Executive Summary

Introduction

- The future battlefield shall be characterised by full spectrum conflict ranging from low intensity to full scale conventional combat including non contact warfare in a nuclear backdrop. In such a scenario, logistics sustenance becomes critical thereby necessitating introspection and review of the existing capabilities. Towards this end, a National seminar on "Military Logistics: Challenges and Way Forward" was organized by CLAWS at the Manekshaw Centre on 03 Jul 15 to examine some of the pertinent issues like teeth to tail ratios, challenges of logistics in multiple terrain configurations, outsourcing initiatives, automation and modernisation of logistics Services and steps taken at the national level to integrate logistics and create strategic assets. Major stakeholders of the logistics system namely senior serving and retired Service officers and heads of logistics in the corporate sector from both India and abroad presented their views. Certain important concepts such as, establishment of a National Logistics Council and state of art logistics command and control systems were discussed during the seminar. The key recommendations are summarised in succeeding paragraphs.

Key Recommendations

Organisational Aspects

- **National Logistics Council (NLC).** A National Logistics Grid integrating and coordinating entire physical infrastructure of logistics at the National level needs to be established. The National logistics grid can be effectively managed by setting up of a National Logistics Council at the apex level. This organisation apart from coordination of logistics shall be responsible for centralised planning and execution for integrated strategic infrastructure development at National level. (para 12 of seminar report refers).
- **Defence Logistics Agency (DLA).** There is a strong case for establishing an organisation on lines of the DLA of the United States (US) Armed Forces for quantifying and coordinating the logistic efforts of the Army, Navy and Indian Air Force (IAF). (para 12 of seminar report refers).
- **Integration with Ministry of Defence (MoD).** Cross staffing between Service HQ and MoD will resolve the deficiency of staff faced by MoD which results in delays in scrutiny and clearing of important procurement cases. This aspect has also been recommended by the Naresh Chandra committee on National security reforms in 2012. (para 13 of seminar report refers).
- **Logistics Coordination Agency.** A military civil coordination agency at the functional level to act as a second tier to the proposed 'National Logistics Council' for integration between Army and civil agencies needs to be established. (para 14 of seminar report refers).
- **Integration within Services.** There is an urgent need for placing the three logistics Services of Army Ordnance Corps (AOC), Army Service Corps (ASC) and Corps of Electrical and Mechanical Engineers (EME) under the overarching umbrella of a 'Logistics Corps' reporting to the proposed Deputy Chief of Army Staff (DCOAS) Logistics (Lgs) for single point accountability. (para 15 of seminar report refers).
- **Theaterisation.** Measures that can enhance theaterisation through utilisation of civil infrastructure and warehousing should be undertaken to the maximum. This should be accompanied by measures such as enhancing the stocking range and depth at Regional Ordnance Depots (ROD), extending the scope of transportation model for direct delivery, formalising concept of maintenance repair and overhaul (MRO) hubs in logistics nodes and providing for dedicated strategic pipelines connecting Fuel, Oil and Lubricants (FOL) stations with refineries in forward areas. Revenue procurement should be delegated to theatre commanders by creating purchase organisations in the theatre commands with fiscal autonomy and maintenance through Performance Based Logistics (PBL) agreements.(para 19 of seminar report refers).
- **Defence Public Sector Enterprises Objective Realisation.** DPSEs must follow a corporate governance structure with greater functional and financial autonomy. There is also a need to institute a structured price monitoring mechanism as also minimise delay in approvals from MoD and facilitate faster issue of licenses and sanctions to the DPSEs. There is a need for the DPSEs to augment their production

capacity and reduce their cost of production. They need to acquire niche technology, best practices and skill sets and also need to have 'ERP based' mechanism for real time monitoring. The DPSEs must ensure lifetime support of the main equipment through uninterrupted supply of spares manufactured on a three year roll on basis. DPSEs must be held accountable to its customers for the slippages and outstanding orders. (para 22 of seminar report refers).

- **Public Private Partnership** (PPP). PPP model between the Department of Defence Production (DDP) and the private sector must be institutionalised on priority basis by carrying out structural changes in the DDP in order to propel government's indigenisation efforts through 'Make in India' and become a world leader in defence manufacturing and logistics with prime focus on systems, and transportation. (para 24 of seminar report refers).

Movement and Transportation Aspects.

- National players in the field of transportation should be registered with the Army does not depend on fly by night operators. Node for move of heavy transport and equipment using a state of art transportation management system needs to be created for containerised loads and special consignments to desired theatre deployment areas. Transportation assets i.e. railway wagons and Civil Hired Transport (CHT) trailers used by the Army for transportation of its heavy equipment by road and rail should conform to the requirements of the Railways and civil road transportation agencies and should be uniform in design. The aspects of survivability, matching mobility and underground storage is absolutely required and must be addressed. (para 25 of seminar report refers).
- **Strategic Partnerships with Logistics Service Providers (LSP).** There is a need to establish strategic relations with LSPs through a collaborative approach and aligning performance metrics**.** (para 31(b) of seminar report refers).

Infrastructural Aspects.

- Obsolete infrastructure should be demolished in favour of building newer and more modern infrastructure duly prioritised by means of a roll on plan duly backed by long term monetary and resource allocation. There is a need to build up and stock theaterised logistics grid of supply nodes in the communication zone with state of art warehousing that offer a 'hook on' system for its dependency on geographical lines through the PPP model. In the Northern and Eastern borders, there is a need to construct infrastructure to sustain logistics through operational works till a coordinated infrastructure plan at the National level is in place and executed. Major logistics bases need to be established well forward in areas such as Tenga in Eastern Command (EC) and beyond Rohtang pass in NC for fighting a coordinated logistics battle. Majority of FOL and ammunition stocks need to be stocked

North of River Brahmaputra in the Eastern theatre. Development of Air infrastructure to service the inaccessible areas situated in Northern Command (NC) needs to be undertaken on priority. Minimum five fully functional Airheads should be established as a part of this development. There is also a need for establishing greater number of landing areas throughout the Eastern theatre, which can take the load of heavy transport aircrafts held with the IAF rather than only smaller propeller driven aircraft. In case landing grounds are likely to exceed a reasonable timeframe for development, then it is an imperative to establish as many as 500 Dropping Zones (DZs) fully equipped with complete material handling and storage infrastructure. (para 32 of seminar report refers).

Budget and Financial Management Aspects

- Defence finance plays an over bearing role in both capital and revenue procurement cases and has a tendency to audit and question rather than advise thus causing delays in procurements. Therefore, the role and charter of defence finance in capital and revenue procurement needs to be redefined. Policies and procedures issued by the Defence Accounts Department (DAD) are issued in an arbitrary and non consultative manner the Delegation of Financial Powers Defence Services (DFPDS) 2015 being the latest such example. All policies impacting the functioning of the Services need to be issued in consultation with the Services after their points of view have been incorporated. The financial management system presently instituted in the Army is long winded, bureaucratic and needs rationalisation at the earliest. (para 38 of seminar report refers).

Logistics Command and Control Systems

- A fully integrated end-to-end logistics command and control system is the need of the hour to integrate various functional areas in the overall gamut of logistics. (para 42 of seminar report refers)

General

1. 'logistics' as a term was first coined by Baron Jomini, a General in Napoleon's Army in the early 19th century. Defined as the '*science of move and maintenance of forces*' in military terms, logistics has proved to be a crucial battle winning factor in campaigns undertaken since advent of warfare. Technologically dominated warfare of the future requires military logistics to re invent itself into a force multiplier and thus transcend from its classical role as military operations in present times are a national endeavour with integrated employment of all resources including efficient and well-coordinated logistics.
2. World over, there is an increasing trend of integrating logistics with National infrastructure. The United States (US) Defence Logistics Agency (DLA) along with US Transport and the Materiel Commands

address the full spectrum of logistics and acquisition services for US Armed Forces. DLA alone employs 27000 civilians, maintains 2250 weapon systems through nine supply chains spanning 28 countries. The US Transport Command is a single point manager for entire defence fleet of road, rail and air while the Materiel Command is specific to each Service. In the United Kingdom (UK), the Defence Logistics Organisation (DLO) and the Defence Procurement Agency (DPA) have been merged to form the Defence Equipment and Support (DE&S) headed by a Chief of Defence Logistics who is either a four star General or a civilian officer and is provided with accountability and authority to execute the logistics of UK Military.

3. The existing logistics system of the Indian Army has stood the test of time in peacetime environment where individual Service is effectively supported by a dedicated logistics establishment comprising professional logisticians. However, given the tempo of future operations the system is found wanting in a number of areas. There are several deficiencies in Army's procurement procedures in its equipment management delivery and distribution systems. There is a complete absence of an overall National perspective on logistics whose entire management and coordination is left to the Services. Decision making at the apex level is slow and unresponsive due to lack of awareness and involvement on part of civilian bureaucracy to the requirement of the defence forces. The defence logistics requirements are usually not incorporated in the National development plans.
4. At the Services level, there is a strong case for quantifying and coordinating the logistic efforts of the three services. At the National level, there is a need to integrate National and military logistics infrastructure for single point authority and control. The vision for the logistics perspective must be a large subset of the joint vision of the three Services and can be realised through streamlining logistics organisation, introduction of the best logistics management practices and exploitation of IT.

Future Logistics Strategies, Procedures and Structures to Meet Indian Military Needs

5. **Logistics Strategy.** A sound logistics strategy flows from the operational philosophy and caters to all possible inter and intra theatre contingencies. It must harness all available resources at the National level and should account for delivery of logistics infrastructure in the desired theatre. Logistics strategy of the future demands an agile and a responsive supply chain that can meet the needs of an unpredictable operational scenario and redeploy logistics resources in the area of operations enhance flexibility of plans and give impetus to development of strategic infrastructure in remote areas.
6. **Procedures.** The biggest challenge that Indian military supply chain faces is its archaic procedures. The variations in infrastructure, environment, terrain and lack of availability of local resources further add to the challenge. The time taken between forecasting, receipt of the approvals and actual procurement is extremely long making the supply chain inflexible in its operation. The equipment profile and ration scales of the

ultimate customers are not standardised thus creating complex logistics footprint. Periodic attempts to prune the inventory have not yielded satisfactory outcome. Even the procedures for accounting and budgetary inflows and outflows are entirely different for varying customers, leading to an increase in inventory.

7. The existing central provisioning procedures often lead to delayed procurements forcing the formations at theatre level and below to resort to local purchase. The procedures for central procurement on the other hand are tilted in favour of the cooperatives who owing to their limitations of operating sub optimal supply chains are unable to meet the requirements of the Army in the desired period. It is therefore essential that the Army moves towards nationally reputed firms in the private sector for servicing its central contracts and utilise their expertise in supply chain management best practices.
8. Central provisioning needs to be derived from Management Information System Organisation (MISO) data rather than on a manual compilation of wastages. The Army Service Corps (ASC) responsible for management of rations should execute flexible contracts aimed at reducing the replenishment cycle as well as the inventory. Industry best practices such as vendor managed inventory need a greater boost to bring efficiency in the Army's Supply chain. There is also a need to adopt a system of direct delivery from source to the ultimate customer as the existing system has become rather unwieldy. The eventual aim should be to reach the level of '*sense and respond logistics*' which can only be achieved when modern supply chain best practices are in place. Execution of total asset visibility, total automation and handling and implementation of other enabling technologies can achieve true supply chain integration.
9. Certain measures that would usher in supply chain excellence are *firstly*, the provisioning powers need delegation at the Service Headquarters (HQ) to avoid multiple sanctions that cause delay and should follow a separate procedure for scaled, non-scaled and additional essential life items. *Secondly*, an automated institutionalised and fail-safe system to monitor the budget expenditure needs to be worked out to enable its re appropriation well in time. *Thirdly*, an e payment system needs to be formalised to receive the payments from the government departments to whom stores are supplied on cost per man per year basis. *Fourthly*, the clause of 'acceptance of necessity' by financial advisors needs a review as the budget at the macro level is already approved. *Fifthly*, the procurement needs to be decentralised at theatre level and the sourcing needs to be carried out from reputed National firms with state of art supply chains.
10. The Army purchase organisation should examine procurement through the commodity derivative exchange. At the theatre and lower levels the aspect of reverse auction, as a reverse step to e - procurement needs implementation. Long term contracts with price variation clause and leveraging the industry for use of cold chain is also a must. Lastly, provisions for allowing connectivity of Fuel Oil and Lubricants (FOL) with the civil setup need formalisation in order to reduce the logistics footprint.

Structures

11. War being a National endeavor mandates all agencies to work in unison in order to support the war

effort. Various ministries and the related entities from the private sector need to support the Armed Forces towards the overall war effort.There is a need for a centralised direction, coordination and control within services under a single manager that must resort to integration of components amongst the Services, the industry, various ministries and departments.

12. The structures created for logistics management need to be in sync with tri services operational doctrine. At the Services level, there is a strong case for introducing an organisation akin to US, DLA for quantifying and coordinating the logistic efforts of the three services. At the national level, this need can be fulfilled through raising of a National Logistics Grid integrating the physical logistics infrastructure while at the National level being managed effectively by National Logistics Council (NLC). The NLC should be organised as a flat organisation rather than through a hierarchical structure and should be capable of a decentralised execution thus ensuring greater say for the Services on issues that affect them.
13. There is a shortage of staff in the Ministry of Defence (MoD) procurement sections. Cross staffing between Service HQ and MoD as per recommendations of the Naresh Chandra committee report, therefore needs implementation. This shall facilitate a greater integration between the MoD with the Service HQ enabling combined logistics support for the three services. It shall also enable centralised planning and execution at National level for integrated infrastructure development especially in far flung remote areas taking into account military requirementsand provide much needed impetus to indigenisation, industrial development and manufacturing.
14. A military civil coordination agency at the functional level to act as a second tier to the proposed NLC for integration between Army and civil agencies also needs to be established. This agency shall be mandated to carry out coordination between Army, state and district authorities with regard to the type and quantum of transportation required by the Army during war, disaster management, out of area contingency and training exercises as also coordinate traffic management aspects. Powered by an increased application of automated data processing technology**,** this logistics coordination agency should also be responsible for functional level coordination of infrastructure projects to be undertaken for meeting both defence and civil requirements including social development along the border areas.
15. **Integration of Logistics within Services.** The ASC, Army Ordnance Corps (AOC) and the Corps of Electronics and Mechanical Engineers (EME) are the logistics Services of the Army tasked with executing the material, ration and the engineering support supply chains of the Army. The existing structures at the Service HQ involve multiple agencies responsible for control of these logistics chains, namely Director General of Operational logistics (DG OL), Quarter Master General (QMG) and Master General of Ordnance (MGO). Capital acquisition on the other hand is the responsibility of Director General of Weapons and Equipment (DG WE) and the Deputy Chief of Army Staff (DCOAS) Planning and Systems (P&S). All of these agencies lack an integrating thread owing to the involvement of a number of Principal Staff Officers (PSOs) resulting in absence of single point accountability. The automation projects initiated by the logistics Services by different agencies in different stages of progress

are also required to be integrated. These infirmities and challenges infuse a multinational concept that leads to a maladaptive supply chain with obvious consequences.

16. The resultant structure must however cause minimum turbulence in the environment in terms of aspirations of the logistics Services and the functional elements linked together through the backbone of automation. The system should be cost effective and pave way forward for savings in manpower and finances. The model also needs to be implemented progressively in a graduated manner and must be consolidated at each stage.
17. In the first stage, Project LOGINET or the Logistics Decision Support System needs commissioning to ensure seamless integration with the line directorates as also interface with Military Operations Directorate and Command HQ. In the second stage functional control of the Director General of Supplies and Transport (DGST) will have to be moved from QMG to the MGO, thereby bringing all the three logistics Services under single head. MGO should be re designated as Deputy Chief of Army Staff (DCOAS) Logistics. In the third stage, cross posting of Director level officers within the DCOAS (Logistics) will be required to be carried out to enhance the level of integration among the three logistics services.
18. Prior to implementing the last stage there is a need to evaluate the model for a suitable period of say three years essentially for consolidation. In the final stage, post consolidation**,** the three non-integrated services verticals should merge into two functional integrated and coherent verticals of '*supply management*' and '*equipment management*'. Similarly, at the level of HQ Command, there is a lack of single point accountability wherein the three logistics services do not have a direct reporting to Maj Gen in charge of Operational Logistics (MGOL). The MGOL can be designated as 'Chief of Logistics' of the particular command and representatives of the three logistics services can be placed under him for a more focused approach towards logistics. Having worked out the larger contours of the integrated model the same could well be translated in theater and lower levels in order to build congruence in structures and processes.
19. **Theaterised Logistics Structure for Self Contained Theatres of Operations.** Theaterisation in the Indian Army does exist today but to a very limited extent. Currently the theaters are self sufficient in terms of ration, transport and FOL and have adequate stocks to meet the operational requirements. The theatres have the capability to sustain additional forces in a plug and play model in any given sector of deployment. Forward placement of ammunition along with stores has contributed towards enhancing sustenance. The Regional Ordnance Depots (ROD) stock a large range and depth of inventory. The theaters are self reliant in undertaking light and medium repairs. Medical support is also theaterised to a certain extent through the enhanced capacity of military hospitals.
20. These efforts are however barely adequate as they do not integrate civil infrastructure and warehousing available in the theatre. There is thus a need to enhance the stocking level at RODs with corresponding reduction of stocks at Central Ordnance Depots (COD). The scope of transportation model of forward

delivery of stores to Regional Ordnance Depots must be enhanced to effect reduction in echelons where feasible. As far as possible Original Equipment Manufacturer (OEM) should be involved in forward repairs thereby reducing the need to stock higher inventory levels of spares, reduce requirements of transportation and related infrastructure. Revenue procurement should be delegated to theatre commanders by creating purchase organisations in the theatre commands with fiscal autonomy and maintenance through Performance Based Logistics (PBL) agreements.

21. The project of connecting dedicated strategic pipelines to existing refineries should be implemented. The concept of engineering support from a dedicated logistics node and maintenance repair and overhaul hub are some of the steps in right direction. The twin process of integration and theaterisation once achieved will ultimately lead towards optimization of logistics.

Defence Procurement for Timely and Effective Logistics –Defence Public Sector Enterprises (DPSE) Objective Realisation.

22. DPSE's were set up with an aim to achieve self-sufficiency and indigenisation of defence production and manufacturing in India. Their expansion was encouraged in the wake of challenges of a nascent private sector contribution in defence production until 1990s. Army is a captive buyer of the equipment produced by the Ordnance Factories (OFs) and DPSUs to a large extent. The Army sources 78 percent of its revenue requirements from OFs, 11 percent from DPSU's and the rest from civil industry and imports. Advance payments to the tune of 85 to 95 percent are made before the item is delivered. Given the dismal performance of the OFs and DPSUs, Indian defence sector is seeing an increased dependence on external sources .The overall result is low productivity level and slow rate of technology absorption given a non-corporate organisational climate in the OFB and DPSUs. A number of technology initiatives and agreements have been signed between OFs and DPSUs but absorption of the acquired technology and retention of skill sets crucial for optimal production have not taken place.
23. In order to ensure that PSUs objectives are realised, DPSE's must be held accountable for the production capability and outstanding orders since it affects their overall performance. There is a need for the DPSEs to augment their production capacity in order to reduce their cost of production. If the DPSE's harness the potential of Small and Medium Enterprises (SME), Micro Small and Medium Enterprises (MSME) they would be able to create capabilities and at the same time reduce their cost of production. Partnering with MSMEs will have their benefits in terms of acquisition of niche technology, best practices and skill sets through offsets which otherwise calls for huge investments in Research and Development (R&D). Greater autonomy in decision making and financial powers need to be delegated to DPSE's so they can make decisions regarding import substitution, outsourcing or a joint venture with a foreign firm. Unique positioning of DPSEs must translate into world class products to meet National security needs in a timely manner.

24. The DPSEs also need to institute a structured price monitoring mechanism which delivers at indent cost and prevent frequent price escalations. Time bound replacement of defective stores as per warranty should be assured to the Services and plans for capacity enhancement should be in place to ensure lifetime support by uninterrupted supply of spares. The OFs should enter into strategic partnership with the services in order to be privy to their long term requirements as well as make them aware of their long term production and technology perspective plans so that cases of unilateral closure of assembly lines and change in specifications are obviated. The DPSEs need to invest in in-house R&D for development of niche, cutting edge and high-end military technology andneed to institute an 'Enterprise Resource Planning (ERP) based' monitoring mechanism on a periodic basis. An instutionalised PPP initiative with the Department of Defence Production (DDP) is the need of the hour to propel government's indigenisation efforts through 'Make in India' and become a world leader in defence**.**

Movement and Transportation Aspects in the Services. Challenges and Best Practices.

25. Movement aspects are critical for a smooth induction of personnel and equipment to the theatre of war. Certain essential considerations as a part of operational move are the safety and comfort of the troops, their timely movement and safety of equipment. Peacetime movement is undertaken as a part of general mobilisation at a much smaller scale and is usually tenure driven. Movement plan is a part of the overall grand logistical plan, which supports the designated levels of war ranging from tactical, operational to strategic. With each enhancing level, the quantum, scale of troops and equipment also rises. At the strategic level, additional movement aspects such as strategic airlift, deception plan, and sidestepping of troops need to be factored. This is unique in two ways; *firstly,* private players cannot participate in these operations and *secondly*, since major movement takes place through railways and the air transport there has to be a lot of inter ministerial coordination to facilitate these movements. Private sector however is intricately involved for hiring civil hired transport (CHTs) and (Civil Hired Tank Transporter) (CHTTs) for movement of stores.
26. The major challenges faced in movement aspects can be discussed under three major areas viz**,** *firstly*, Infrastructural inadequacies which occur due to lack of capacity generation. Infrastructure is lacking in certain areas thereby creating problems with regard to sustenance of volume and traffic to be handled. *Secondly*, mismatch between type and the quantum of the assets required for transportation *vis-à-vis* its availability depending on the demand-supply gap and *lastly*, the procedural and maintenance issues.
27. **Road Movement.** As far as the road movement is concerned, there is inadequate road infrastructure especially in vicinity of border areas resulting from lack of capital investments, delay in getting environmental clearances that prevent the construction of roads. Non-availability of CHTT and short supply of trailers of requisite dimension for transporting specialised vehicles as required by the Army.

These factors make the mass mobilisation in operationally acceptable period for hinterland formations extremely difficult especially when it has not been rehearsed. Sensitisation of civil administration and coordination regarding security, road space management, priority of movement and availability of parking spaces are also challenges inherent in movement by road. Same is compounded especially when the movement has to take place over a number of states and districts.

28. Army has a paucity of service transport and mostly resorts to hiring of CHT that has its own set of problems in terms of availability, procedural and accounting issues. The National players of the transport industry have shied away from registration with the Army, which is a mandatory procedural requirement. In the absence of registration, Army is not able to exploit these available National assets due to procedural bottlenecks. Multi configuration vehicles on a common vehicle platform, transport management software and containerisation should be introduced on priority.
29. **Rail Movement.** The Railway infrastructure available is highly inadequate as far as the requirement and speed of military traffic is concerned. There is also the issue of route congestion and lack of technical staff at detraining stations owing to an overall shortage of trained work force with the Railways. In addition there are procedural delays due to over dimension clearance and inadequate maintenance of defence assets by the Railways. The availability and mustering of stocks is also a major problem as there is lack of land with the Railways for stabling of stocks. There is also a restricted or even non-availability of approaches to entraining and detraining stations due to encroachments in metropolitan cities as well as strategic border areas. Lack of infusion of capital has restricted the capacity generation, which is restricting the volume, and speed of traffic. The railway wagons owned by the Army and lying idle in peacetime can be utilised by the railways provided they are in conformity with the size required by the railways. Initiatives such as Containerisation need to be implemented in order to boost strategic move. These assets namely wagons and containers can be fitted and monitored through technology application of Geographical Information Systems (GIS) / Radio Frequency Identification Device (RFID) so that they can be easily located and harnessed on as required basis.
30. **Air Movement.** There is a predicament of availability of cargo aircraft assets including commercial cargo aircraft, as very few in numbers are available with the civil commercial airlines. There is also a shortage of pallets within the Services for loading in new generation of transport aircrafts. Material handling equipment at emplaning and deplaning airfields is also a problem thus increasing the problem of handling heavy loads. Inter ministerial and departmental coordination too becomes a problem, as no structures exist for ironing out the nuances at the functional and execution levels. There is an urgent need to institute a high-powered structure, which can come into play at the time of war and natural disaster necessitating a strategic move, which can coordinate the requirements between the Army formations, IAF, Ministry of Civil Aviation or any other department so involved. Development of airfields and composite aviation bases for all theatres needs to be taken up at the earliest.

Movement and Transportation Aspects; Corporate Best Practices.

31. In the corporate world, business landscape is changing due to global sourcing- particularly from low cost countries. Logistics is therefore becoming a strategic business function. 'Buy anywhere Sell everywhere' business model demands logistics strategies to respond to the complexities of global logistics management to reduce transportation costs and improve services levels. Companies are realising that logistics has to be a special core competency and not just a peripheral management subject. Some of the best practices followed in the corporate sector globally are:-
    (a) **Determining the right logistics-operating model.** Companies are assessing whether to develop in house competencies related to logistics network design, logistics sourcing and management, transportation capacity planning, global shipment planning, visibility and event management. Logistics execution functions such as pre booking and booking confirmation in ocean transportation, managing export import customs clearance and document compliance, warehousing and storage are being outsourced.
    (b) **Establishing strategic relations with logistics service providers (LSP) and aligning performance metrics.** Companies are elevating their relationship with logistics service providers to a strategic level. Companies are becoming LSP friendly and are adopting collaborative approach. They are providing forward visibility into their logistics capacity needs, jointly developing packaging that allows for easier handling. Corporates are leveraging their relationships with customs brokers, freight forwarders and other third parties and are forming strategic relationships.
    (c) **Optimising from intelligent routing and consolidation:** To deal with transportation capacity issues as also to maximise utilisation of containers, companies are now moving towards a more dynamic process, one in which they can make decisions on ports, inland transportation mode, carriers etc and look for consolidation opportunities for their shipment volumes. Leading companies are now dynamically evaluating options for merge-in-transit, leveraging hubs for pool distribution, doing trans-loading, and diverting- in-transit to reduce cycle times and costs.
    (d) **Performance Based Logistics (PBL).** Corporate sector has switched over to PBL. PBL is a more efficient approach to improve the overall effectiveness of logistics and is based on forming partnerships between MoD, Services and private sector. One area where performance based logistics concept is applied is Life Cycle Product Support. This covers logistical activities related to maintaining weapons and equipment in operation including repairs, refurbishments, modernisation and upgrades. This concept, if applied, can result in large savings in logistic costs. Management of components and spares required for maintenance and upgrades for weapons and equipment can be brought under the PBL. This would ensure rapid delivery of the needed spares and reduce storage and inventory costs.

Infrastructure for Logistics for Operating Self Sustaining Theatres.

32. Infrastructure is the most important aspect for execution of a successful logistics system in the long run. Indian Army has gone through modernisation since independence and substantial amount of funds have been allocated for the 11th and 12thArmy plans towards building up infrastructure. However, till date we are far from a well-developed infrastructure in the border areas. Major problem areas are that of land acquisition and environmental clearances, those of lack of private sector participation in development of infrastructure and finally the absence of decision making at the apex level. There is a need to demolish obsolete infrastructure and replace it with newer and more modern one while addressing the issues of roads, railways, air, FOL and warehousing. The problem of inadequacy of composite nodes to support operations also needs to be addressed. Presently, the supply nodes do exist but are stocked to cater only for their affiliated formations, which will not suffice for operations. There is a need to build up and stock theaterised logistics grid of supply nodes with state of art warehousing through PPP model which offer a 'hook on' system for sustenance of a given dependency planned to be inducted in its geographical jurisdiction.
33. The present model of military stations is unviable and there is a need to go in for construction of smart military stations on the lines of smart cities, which are viable and easily managed. Lastly, in the Northern and Eastern borders, we need to construct own accommodation on the International Border (IB) even if it is of a semi permanent nature through op works. There is also a need to exploit the civilian infrastructure such as dedicated freight corridors, which are going to be operational in 2020.
34. The Northern areas of Ladakh are cut off for six months and when not entirely cut off; remain serviced by two available axes, vulnerable to weather and enemy fire. A strategic railway line for these areas has been mooted; however, it is still in conceptual stage and may take minimum two decades to take shape. In such a scenario, development of Air infrastructure is an inescapable imperative for sustaining forces in war. Paradoxically, however, in this domain the defence infrastructure of the IAF in the form of Airports at important emplaning bases such as Chandigarh that services the Ladakh sector is being utilised by the civil aviation sector. Regular sustenance to Ladakh sector is only possible if minimum fivefully functional Airheads are established.
35. The Eastern theatre having had the advantage of supported a large scale campaign during WW II is a fairly well developed theatre of war since the British times and is self contained for basic support systems. However, given the present magnitude and scale of battle, it may not be able to support a long drawn war unless upgraded. Today the forward areas are within a 72 hours turnaround from the logistics basis in the North East (NE), an avoidable situation as these areas can be easily isolated during operations. The planned railway line will entail huge costs and time to establish hence this area too urgently requires a number of Airheads both North and South of Siliguri corridor. The principal logistics bases now need to be set up in forward areas such as Tenga in EC and beyond Rohtang in

NC for fighting a coordinated logistics battle. The Army therefore must push with the government for construction of tunnels through Rohtang and Zojila in the desired period in order to sustain the force levels in Ladakh. Similarly, majority of FOL and Ammunition stocks need to be stocked North of Brahmaputra in the Eastern theatre during peace as during operations, the national grid will not support the ammunition infrastructure in the required time frame. Though there is a thought process for the ammunition to be stored underground, the idea has not really reached the execution stage and needs to be pursued to economise on precious land resources.

36. The logistics plans need to enmesh in such a way into the National development plans that the civil fleet of passenger aircrafts held with commercial airlines is fully exploited during operations. There is a need for establishing greater number of landing areas throughout the Eastern theatre, which can take the load of heavy aircrafts of the category of C-17 Globe master ,C 130 Hercules and IL 76 held with the IAF rather than only smaller propeller driven aircraft. In case landing grounds are likely to take more time to develop, it is imperative to establish as many as 500 Dropping Zones (DZs) with complete material handling and storage infrastructure at the earliest.
37. In the Western sector, the transport infrastructure on the Army needs a revolutionary change. The corporate sector and logistics service providers have graduated to 20 metric tonnes four to six axle trucks with 10 to 60 metric tons trailers for transportation while the Army is still using five to seven metric tons trucks. This leads to a problem in moblisation due to lack of capacity as well as problems of utilisation of civil repair and recovery infrastructure by the Army during operations due to lack of commonality. There is a need to reduce reliance on the railways and divert the scarce budget on outsourcing to civil road transport infrastructure who is presently transporting about half of advance winter stocking (AWS) for the Northern region.

Financial Management Aspects in Support of Effective Logistics

38. In the context of Armed forces, the field of logistics deals with expenditure of national resources. Any saving of cost in logistics would enable diversion and use of the limited budgetary resources, on development and modernisation of defence forces. An integrated approach in logistics is also a necessity since multiplicity of procurement agencies and other logistics agencies is not conducive to obtaining the best '*Value for Money*'. The revenue stores budget always falls short of the Army's requirements however past data reveals a diminishing annual allocation coupled with a diminishing annual expenditure. The reasons for this paradox are, *firstly*, the higher competent financial authority (CFA) i.e. the MoD is vested with authority without accountability wherein the procurement cases are delayed on procedural issues while the onus of getting that file cleared rests with Service HQ. This needs to be remedied. *Secondly*, defence finance department plays an over bearing role in any procurement case and has a tendency to question rather than advise thus acting as a hindrance. One recent example

of this is the Delegation of Financial Powers Defence Services (DFPDS) issued in 2015 issued by MoD (Finance) going beyond their charter. This document instead of giving out the financial powers, lays down a plethora of rules, regulations and procedures, which in certain cases are in contravention to the Defence Procurement Manual (DPM).

39. The Service HQ on its part is unable to make long term forecast of demands hence capacities of DPSUs /OFs is not utilised and synchronised with the Army's requirements. Even in case of items, where long term plans exist the targets have not been realised due to a number of reasons. In case of ammunition, where the Army has presented its second five year roll on plan and has forwarded its long term requirements to the OFs. If orders for five years fructify without considering the annual wastages, Army may land up with surplus ammunition. Army may not be able to expend these surpluses even for training purposes and hence may have to dispose expensive ammunition without really using it. Similarly, electronics is prone to technological obsolescence. Bulk orders of complex electronic equipment based on long-term forecast, have a good chance of becoming obsolete. The oft-debated issue of generation of pragmatic and practical General Staff Qualitative Requirements (GSQRs) and rationalising field trials for accountability needs to be stream lined within the Services.
40. The way forward for rational budget expenditure is that the accountability of the CFA i.e. the MoD and the processing staff needs enhancement. In addition, the role and charter of defence finance needs to be re-defined. As per the norms of GFR, the budget is to be utilised as per laid down heads of capital and revenue. The internal restrictions imposed by the MoD giving sub classifications of expenditure lead to further delays in procurement and eventual budget surrenders. Fiscal autonomy needs to be vested in the theatre commanders and a central purchase organisation needs to be created in each theatre command. Lastly, there is a need to develop a defence industrial base for military goods.
41. The issue of life cycle sustenance of complex equipment should be resolved at the time of acquisition itself. *e.g.* since the indigenous defence industrial base is inadequate and import dependence is heavy, we must go in for longer periods of procurement of Manufacturers Recommended List of Spares (MRLS) rather than the present arrangement. Newly raised formations have dipped into the War Wastage Reserves (WWR) for equipment that is at an all time low and needs to be made up. The present procurement system does not foster entrepreneurship but encourages fly by night operators, traders and vendors. The recent 'Make in India' initiative is heartening and needs to percolate down to the defence manufacturing. The bureaucratic procedural framework needs a review and private sector has to be given a level playing field in case any meaningful private sector participation in defence sector is to be encouraged.

Logistics Command and Control Systems

42. Replacing inventory with information using logistics command and control is the way forward for being better prepared for the next conflict. End-to-end visibility can ensure delivery of right items

to the right place at the right time, in a proactive, rather than reactive manner. However, 'Total Asset Visibility' is only possible when information fed from forward troops is available in near real time and actionable. ERP systems have not been very successful across the board in managing military supply chains. Europe and the USA is a battleground littered with failed Military ERP logistics solutions ranging from schedule delays of two to twelve years with up to ten times the expected costs and no significant military enhancement. More than an ERP, a fully integrated end-to-end logistics command and control system is the need of the hour to integrate various functional areas in the overall gamut of logistics. These functional areas represent the spectrum of the domains that support the military force readiness cycle from planning, operations, simulation, modeling the logistics plan, conduct of rehearsals to support that plan, transport, move and finally distribution of assets to supporting the operation.

43. A state of art logistics command and control system once deployed, will be a grid of ruggedised notebooks coupled with hand held mobile devices capturing data from the front line about the supply chain, inventory held and how maintenance is being scheduled. The data will give the commanders an instant view of the performance in terms of the mean times between failure (MTBF), analyse the mean down times of platforms, look at the material availability as also see how that is impacting on the platform status of key equipment. Logistics as a battle-winning factor has retained its place and shall continue to do so in times to come. What may change is the ability to actually field these 'command and control' systems and by capturing data, exploit the information it provides, to have an operationally optimised and efficient logistics system.

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