Logistics Support in the Eastern Himalayas

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INTRODUCTION

June 1986 could be said to be a red letter month for the Indian Army. The Chinese intrusion in the Sumdorong Chu Valley came as a sêvere blow to the pride and precision with which we have come to perform our role of securing our borders against alien intrusion. It was a reminder of October 1962, for today even a minor transgression is as hurting to the Indian pride as the debacle of 1962. To prevent any further forays by the Chinese it was essential that we invigorate our presence in the region. In doing so the Army has had to face one of the strongest challenges posed by nature to mankind, that of surmounting the vagaries of weather and terrain in the Eastern Himalayas.

The Eastern Himalayas of operational interest to us would consist of the areas of Sikkim, Arunachal Pradesh and the areas bordering these two states in Tibet. While Sikkim and Arunachal Pradesh are quite inhospitable, the Tibetan tracts are more so with heights over 4500 metres, extremely cold weather and further distancing of logistics bases from the plains of India. The Eastern Himalayas was virgin territory before the army decided to make its presence felt in tune with government policy. Lack of communication links with the rest of the country had preserved the beauty and serenity of the land but considerations of defence necessitated disturbing this aura of innocent charm. Sparsely populated, the region remains untouched by the vestiges of civilisation on its southern fringes. It is an under developed area and it is therefore axiomatic that the administrative problems would be enormous.

The British who ruled the plains bordering the Eastern Himalayas feared to tread in this area inspite of their fierce adventurist spirit. It was thus left to the Indian Army to pioneer its way through the mass of jungle and snow. When the Army moved in 1962, it retired grievously hurt. While the strategic and tactical causes of this debacle have been extensively discussed, the logistics aspect is generally ignored. A deeper study of the engagements would reveal that 1962 was as much a logistics failure as a tactical and strategic one. It was an all too familiar story of troops without proper clothing and guns without ammunition and these aspects touch just the periphery of the problem of the vast canvas that logistics represents. Our experience in successfully conducting operations in Jammu and Kashmir in 1947-48 had perhaps generated unto us a sense of confidence which was found misplaced for the logistics problems in the Eastern Himalayas are vastly different and even

more dynamic than that in Kashmir. It is therefore essential that the tendency to view our entire mountain belt as a single entity and evolve common problem solving methods be avoided and a fresh view of the logistics considerations be attempted.

AIM

The aim of this paper is to analyse the various factors which affect operational logistics in the Eastern Himalayas region and suggest measures to alleviate the administrative hazards at the macro as well as the micro level.

TERRAIN ANALYSIS - THE LOGISTICIANS VIEW

Flanked as it is by Tibet in the north, Burma in the east and the Brahmaputra Valley in the south, the Eastern Himalayas present us a curious mix of all these regions. Starting from our borders in the north, the terrain assumes a tiered configuration of mountains with ridge lines interspersed by spacious valleys. In the Kameng-Towang sector for example there are four such ridge lines namely the watershed of the MaCmahon Line, the Sela massif, the Bomdila massif and the Sessa-Nichu Phu ranges. The first two tiers remain snow bound for most parts of the year, where altitudes peaks to 5000 metres and the peculiarities of the area render survivability difficult. In East and North Sikkim except for the plateau region the terrain is much the same. In the Siang-Subansiri region the mountains are less demanding but the dense forests and steep ridge lines take on their own hazardous complexion. The Tirap area provides us another dynamics akin to the jungles of the Hill states of Nagaland and Manipur.

A critical factor in the analysis of terrain from the logisticians point of view is the paucity of communications. The enormity of terrain has demurred the development of communications in the region. Rail communications is virtually non existent while the road communications are sparse as compared with the vastness of the region. The area is densely forested with primary as well as secondary jungles. The ridge lines being steep and rocky do not favour large scale cultivation. Local resources are thus sparse. Apart from an abundance of timber other basic building materials are not available. The climate in the Eastern Himalayas would tell its own story. The winters in the northern part are extreme. Survivability above 3500 metres is difficult without adequate precautions. The monsoon season extending over three months in a year gives little respite. This combination of terrain and climate has rendered the Eastern Himalayas one of the most difficult areas in the country except perhaps the glacial wilderness of Siachen. Comments are frequently heard from people with experience in other difficult areas classifying it as by far the worst to live and fight in.

GENERAL LOGISTICS HAZARDS

Paucity of Communications. The paucity of communications in Sikkim and Arunachal Pradesh is a major constraint on logistics. The availability and reliability of the roads reduces as one moves away from the plains, north and north eastwards and as the northern tracts are the ones of main operational interests, the sliding scale rule applies to the denigration of logistics convenience. A very specious argument of not building too many roads for fear of opening them to the enemy is frequently put up with little logic. For roads must be constructed to sustain minimum envisaged deployments and negative logic being defeatist in nature can never be applied to military situations. This apart the configuration of most roads is longitudinal thus there is an absence of laterals within the region isolating each of the sectors. The road classification is poor. Apart from the handful of main roads which are class 9/18 two way, black top, all weather, other roads are mainly one way fair weather. Efforts are however at hand to undertake the development of a road network on priority but for another decade or so till the settling of the newly constructed roads takes place the problem will remain.

Weather. The weather in the Eastern Himalayas is particularly hostile throughout the year. The winter extending from December to April is severe. This is followed by an equally severe monsoon which extends for three months from June to August and frequently spills over to September. This weather imposes heavy burden on the administrative infra structure. During winter survival is difficult due to extreme vagaries of the weather. During monsoons communications are frequently disrupted due to heavy rains. Supplies and equipment are affected by the harsh weather throughout the year. April-May and October-November are the only reasonably good months in the region from the weather point of view.

Local Resources. The Eastern Himalayas can be ranked as one of the most inhospitable regions in the world for flora and fauna. Local resources of food and supplies are hence scarce partially due to the non-exploitation of rich natural potential. The numerous Valleys have great scope for agriculture and animal husbandry but this asset is being tapped only recently. Timber however is available in plenty.

Health and Hygiene. The perils of terrain and climate in the Eastern Himalayas are a great hazard to health and hygiene. During the winters the danger is of snow and cold diseases. The effect of high altitude is ever prevalent throughout the year. There is thus a necessity of deployment of a large quantum of medical resources in the area.

Reduction in Human Efficiency. Besides high altitude, the climate effects

in the Eastern Himalayas are such that there is a general reduction in the efficiency of individuals. Mental blocks are common and occur more frequently than physical inefficiency. Creativity is particularly affected. The problem is a combination of the effects of altitude, desolateness of terrain and weather.

Equipment Performance. The average altitude varies form 600 to 4000 metres. Most of the terrain falls in the high altitude region as such a heavy reduction in equipment performance is to be expected. For instance a helicopter capable of carrying 4000 kgs at sea level can be expected to carry no more than 1500 kgs at the higher altitudes, denoting a reduction in performance by more than half. A similar constraint is experienced in operating of other vehicles and equipment such as rock drills. The rate of break down is quite heavy in all cases.

Teeth to Tail Ratio. The teeth to tail ratio in the Eastern Himalayas is high. The line of communication being fairly long as a result at each stage it has to be suitably propped up thus extending the logistics tail. On a rough conservative estimate every single man on the firing line in the forward defended localities would have to be supported by three men in the rear. The effect of this is an exponential increase in the teeth to tail ratio.

Water. Potable water is generally available upto a height of 3500 meters. However on mountain tops at even lower altitudes water is a problem, the same being the case at heights above 3500 metres. Water borne diseases are easily communicable in the mountains in this terrain. Hepatitis has to be particularly guarded against. In addition amebiasis is easily contracted due to water hazards. A perennial source at altitudes above 4500 metres is snow though it is difficult to utilise.

ANALYSING AND OVERCOMING PROBLEMS

GENERAL-AN INTEGRATED APPROACH

The necessity for our armed forces to operate in the Eastern Himalayas is likely to remain unchanged over the next three to four decades as the threat perceptions are not likely to alter radically. If that be so, overcoming logistics support problems assumes importance. Logistics as we understand is an all encompassing feature of a military force. It not only affects the efficiency of the military but has considerable spin offs in the civilian sector and vice versa. It is therefore necessary that the problem of logistics in the Eastern Himalayas be solved in conjunction with the development projects being undertaken by the civil administration so that a common infra structure is built up for the benefit of all.

There is also a necessity of solving the problem with a holistic approach rather than extempore reactions to each minor irritant as it arises. Thus for

example the solution to the problem of supplying atta is not just that of transporting atta from Assam to the state, moving it by various modes such as train, MT, AT or air and finally man packing it to the forward defended locality. An integrated approach could well mean that the potential in the Valleys of Dirang or Zimithang could be exploited to grow more food within the close proximity of the forward troops thus obviating the necessity of the long chain of supply. On the other hand this would provide well deserved means of employment as well as sustainment to the local population, introducing relief measures and taking them away from traditional means to more intense means of agriculture. In line with this approach the Defence Research and Development Organisation (DRDO) has undertaken some projects to exploit the potential of this region. But this is a small step. Other fields too deserve attention. It is only through an integrated approach that we can reduce the logistics burden from a long term view. A systems approach thus would envisage shifting of the logistics base from the plains of India, Assam and Bengal to the reasonably hospitable valleys. The aim being not only to reduce the turnaround from the base to the forward troops to 24 hours from the present 72 to 96 hours but also to build up a local resources base in terms of food and fodder.

The numerous problems of administrative support in the Eastern Himalayas are thus analysed and solutions presented in the succeeding paragraphs.

DEVELOPMENT OF NATURAL RESOURCES INFRA STRUCTURE

We have already seen that the Eastern Himalayas are devoid of natural resources which is a combination of the factors of the harshness of terrain, and under development. However within this region are numerous areas particularly those in and adjacent to the salubrious valleys which can be utilised for development of agriculture, dairy products and animal husbandry projects which would assure the creation of a natural resources infra structure. The abundance of grazing facilities even upto altitudes of 3500 metres could be suitably exploited. The region can deliver a high produce of potatoes, corn and even fruits such as apples and oranges. Similarly sheep breeding can be undertaken at high altitudes as the local graziers would bear testimony. The attendant benefit of the betterment of the living conditions of the local populace can hardly be ignored. Thus the development of an imminent infra structure is the first step recommended for alleviating the problems of logistics support in the Eastern Himalayas.

ROADS AND TRACKS

Roads and tracks assume great importance in the mountainous Eastern Himalayan tract due to their scarcity and the susceptibility of these few roads and tracks to numerous interruptions. Most roads are Class 5, one way fair weather. These can take limited three ton traffic as far as it is not sustained over a period of time. The maintenance of the road communication network and the operational tracks is a major concern. At times even forward troops would be committed on this task particularly during the monsoons. Mule and foot tracks too deserve special mention. All animal transport tracks need to be soled with stone and or wooden logs to facilitate their utilisation during the monsoons. Unless soling is resorted to the tracks would not be operational in bad weather. The effort required for soling is quite heavy. A task force of 100 men can sole merely 500 metres in one day in an area where logs and stones are easily available. In other areas additional explosives and manpower would be required. Soling should be carried out prior to the outset of the monsoon as the pre monsoon showers with intermittent dry spells would enable setting of tracks before the severe monsoons break in.

A similar requirement on a much larger scale would be necessary for a Class 5 road and other roads of higher classification. This task is obviously better suited to be carried out by the Border Roads Organisation.

The paucity of communications renders traffic control an essential feature to ensure maximum utilisation of the road space as well as avoid breakdowns and bottle necks due to over use. Convoy timings will be a common feature in the mountainous terrain. Traffic control posts will have to be established to control traffic. These need to be composite control points with recovery as well as medical arrangements.

LOGISTICS VEHICLES

The peculiarity of the mountain roads and operational tracks visualises the necessity of a logistics vehicle with a smaller turning radius, lower centre of gravity and at the same time a better load carrying capacity without being affected by terrain and altitude. The ability to operate in extreme cold climate is another pre-requisite. While winterisation could effectively off set the disadvantage, introduction of vehicles with in built winterisation could be attempted. All vehicles have to be preferably four wheel drive to operate off tarmaced roads.

CARRIAGE OF LOADS

In the Eastern Himalayas due to the poor development of communications arrangements for carriage of loads assume great importance. While

movement of ammunition stores, supplies and equipment upto roadhead is a major problem because of the lower specification of roads, susceptibility to adverse weather and limited space restricting two way traffic, beyond the road head the problem of movement of loads assumes gigantic proportions. The sources available being as follows:-

(a) Animal Transport.

(b) Porters.

(c) Helicopters/Air supply.

Animal Transport. Animal transport is a load carrying agency with maximum capacity in the mountains. A mule section is capable of moving loads upto half a ton in high altitude areas over distance of 12 to 15 kms in a day. A troop of eight sections can be expected to move four tons of load each day over the same distance. To move the same quantity two and a half helicopters MI 8 or MI 17 and 160 to 200 porters would be required. However mule transport suffers from numerous disadvantages as follows:-

(a) Mules have large domestic logistics requirement.

(b) Cross country movement even on goat tracks or pony trains is virtually impossible. A track of minimum two metres width has to be developed for employment of mules. Besides this track has to have a gradual gradient, be soled and regularly maintained to ensure sustained move of mules.

(c) Mules require acclimatisation before employing them in high altitude terrain. Presently mules are bred mainly in the plains of Uttar Pradesh and thereafter inducted into mountainous and high altitude terrain. These thus require extensive acclimatisation and even then do not get used to operating in the mountains and high altitude terrain.

Porters. Porters have to be invariably employed where tracks cannot be developed for the use of animal transport. Similarly in many operational situations such as for the move of reorganisation stores, porters ramain the only option. These suffer from a major disadvantage of limited load carrying capability. Fighting porters have to be invariably employed due to the limited population in the Eastern Himalayas.

Helicopter/air supply. The employment of helicopters and air supply for carriage of loads is susceptible to a number of disadvantages such as reduced load carrying capacity in high altitudes and constraints of weather. But the same does not preclude its use as the flexibility and emergency resupply capabilities offered by its use are excellent advantages. Nevertheless its availability is to be always treated as a bonus and cannot be planned for.

OVERCOMING PROBLEMS OF LOAD CARRIAGE

The operational efficiency of a force in the mountains depends on its capability for carriage of domestic loads including ammunition, ration and equipment. The speed and distance to which load can be carried would therefore determine the mobility of a force. It is thus essential that this problem be solved with urgency. Some suggested measures are given below.

Development of Animal Husbandry in High Altitude. The current practice of breeding mules in the plains and later employing them in high altitude terrain is not proving effective. There is a necessity for developing animal husbandry units in the terrain where employment of the animals is planned. Even if such rearing is not possible on the mountain tops, numerous valleys could be exploited for establishment of such breeding centres. Another area which can be developed is rearing of the versatile Yak. The Yak is ideally suited for high altitude and can operate at all heights over 3000 metres. Its load lifting capability is the same as the mule but has an added advantage of limited domestic logistics requirement as the yak can sustain itself on local fodder and eat-icicles for water. It does not require specified track for movement and can operate even cross country for reasonable distances. Another versatile animal in the high altitudes is the burro like local pony, rearing which could be attempted easily in the numerous valleys of the region. These local animals require a break in period as they are extremely temperamental and hence somewhat difficult to adjust to the military requirements.

Porter Units. The load carrying capacity of local porters is twice that of persons from other regions. It is therefore essential that porter units should be raised for the carriage of loads with each porter capable of carrying upto 30 kgs of sustained periods. The paucity of population in the mountains can be made up by enrolling even women in such units as their load carrying capability is the same as men.

Helicopter/air supply means. The necessity for introducing a helicopter with all weather capability and ability to operate with more effective loads at higher altitudes is paramount. There is a need for indigenous development of such a machine as only three countries in the world would require this technology; India, China and Pakistan. Thus foreign pastures for this technology are not going to be available. Similarly there is a necessity of developing an aircraft capable of all weather performance.

SUPPLIES

Today supplies to troops deployed in the Eastern Himalayas are transported from the plains. The story of a goat or a sheep from Rajasthan being transported to remote Nathula or Teju is not a strange one. Milk is not obtainable in the region resulting in excessive utilisation of milk powder with

attendant health hazards. As troops from the northern parts of the country are heavily dependent on milk and milk products for nutrition this deficiency deserves special mention.

The requirement of high energy food for conducting sustained operations in the area has hardly been ignored. While the rations today are nutritious, certain other areas could also be exploited. Yak product could provide a veritable store house of high energy food. The yak is as versatile as the cow and provides milk, butter and cheese locally known as, "churbi". Yak meat is also very nutritious. However the inhibitions to eat this being similar to beef, would be difficult to overcome. Beef also deserves mention in this respect. Development of a ration of the composite variety in vogue in the pre 1975 period which is ideal for manpack sustenance also needs consideration. Items such as fast cooking noodles could form a part of these rations having found acceptance amongst our troops today.

The requirement of motor fuel is comparatively less due to lesser dependency on fuel borne transport. But vehicles consume greater quantity of fuel and reduced kilometres per litre (kpl) due to gradient and altitude. There is a great requirement of winterised fuels and lubricants which is frequently ignored. Adequate stocks for these have to be built up without which operations cannot be sustained during the winter. Similarly the requirement of kerosene oil for cooking and warming purposes is also very large. Keeping in view the environmental hazards even below the tree line troops should be supplied kerosene oil to prevent them from denuding the forest resources.

MEDICAL

The essential feature of health maintenance in high altitude terrain is acclimatisation and avoiding over exertion. These two factors will go a long way in reducing casualties. Acclimatisation schedule has to be rigorously enforced and the general tendency to shirk it or cut short the period should be avoided. This will also ensure a vastly efficient force. Historical examples of General Zorawar Singh's campaign in Tibet should not be ignored. It was the inuring of his troops to cold and high altitude conditions that ensured a successful conduct of the expedition. The availability of medical facilities is also directly related to morale. Where resources would permit maximum sub units especially those at isolated and hazardous posts should be provided with a medical officer.

Casualty Evacuation. Another aspect of medical is casualty evacuation. It poses a major problem in the high altitude and mountainous terrain. This is so as the means of evacuation are extremely cumbersome and time consuming. To organise this a uniformity in the chain needs to be established thus:-

--Maximum use of helicopters for casualty evacuation from forward posts and picquets is envisaged. Each post has to have a helipad suitable for a light helicopter.

--Location of regimental aid posts and advanced dressing stations well forward. These have to invariably have larger helipads.

--Since bad weather is likely to preclude evacuation by air in most instances adequate facilities for evacuation by the land route whatever its configuration should be established. Staging posts invariably needs to be at four hourly intervals to establish a viable evacuation chain.

CLOTHING AND EQUIPMENT

Today the clothing and equipment available to troops operating at high altitudes is adequate to ensure survivability. The only drawback being that of weight. Lighter equipment such as snow mattresses and sleeping bags are available extensively in the world market today. These need to be procured or indigenously produced. Similarly availability of light snow tentage can also be explored. As most of these loads have to be carried by individuals it will go a long way in ensuring the mobility and survivability of the troops in this area.

AMMUNITION

The load of greatest consequence in any military logistics requirement is ammunition. Its weight, volume, reactivity and general cumbersomeness makes it very highly administration intensive. While small arms ammunition would pose lesser problems especially with the introduction of the 5.56 mm INSAS, artillery ammunition would be the biggest impediment. Introduction of light ammunition into service is a much vaunted issue but one which cannot be expected to be solved in a reasonable time frame. A measure which can be implemented immediately is that of palletisation of loads. Thus each ammunition load starting with a manpack one can be build up progressively to form larger pallets which can be moved on mules, one ton and 3 ton vehicles and helicopters. Mechanical loading and unloading facilities at each transfer points as well as gun areas would greatly ease and speed up loading and unloading.

REPAIR AND RECOVERY

Ironically though the quantum of mechanical equipment in the mountains is less, the requirement of repair and recovery facilities is extensive. This is so because of greater number of breakdowns due to the rigours of the terrain and climate. This apart equipment such a radio sets and rock drills have to be maintained at altitudes over 4000 metres. Under such circumstances the repair and recovery resources will be invariably over stretched.

Workshop detachments would have to be split in smaller configurations not normally advocated. Lack of flat areas and hard standing would thus have to be made up by ingenuity and improvisation.

Most mountain roads in the Eastern Himalayas are operational tracks which are yet to stabilise. The surface is thus a great hazard for motor vehicles. Besides the effect of high altitude reduces the Mean Time Between Failure (MTBF) considerably. The essential measure to overcome this drawback is to develop indigenous technology for vehicles and equipment which can be used in this type of terrain. This is so as equipment with requisite characteristics is not available in the world market as the terrain/weather configuration is peculiar to our northern borders. In as much as vehicles are concerned additional spares particularly tyres, road springs, clutch plates and brake accessories have to be catered for with the workshops as well as unit repair teams. Workshops will have to undertake quite heavy workload contrary to popular belief as the number of breakdowns is large. Adequate recovery resources have also to be catered for. Scaling of recovery vehicles could be roughly worked out at the rate of one vehicle for every 10 kilometres of an operational track in addition to those at critical defiles. For tarmac roads a recovery vehicle every 50 kms stretch with a 10 percent reserve is essential in addition to those at critical defiles.

WATER

To overcome the problem of the shortage of potable water the following expediencies need to be resorted to:-

--Divising deicing kits which can easily convert ice into potable drinking water at higher altitudes.

--introduction of simpler water purification and filteration sets with larger capacities but at the same time light to carry.

--Better individual water sterilisation kits.

--Effective enforcement of water purification drills.

CACHE CONCEPTS

For sustainment of small forces such as stay behind parties, patrols and early warning elements the concept of development of a chain of caches along the likely route of operations should be employed. These caches would greatly increase the mobility of such parties, rendering them free of load carriage for the operational period envisaged. The caches should be stocked with composite loads of rations, ammunition and spares such as batteries. Due to the effect of the altitude and weather, preservation of rations at least

is ensured. Even on the normal maintenance routes such caches could be located and suitably replenished so as to reduce the load of individuals during routine movements. The locals too adapt this concept to an extent with the "goth" huts at halting places enroute well stocked with wood and other cheap necessities of life. A sophisticated version of this is the Alpine huts concept followed in the European countries.

SUMMARY OF RECOMMENDATIONS

A summary of recommendations to overcome the logistics problems in the Eastern Himalayas made in this paper is as follows:-

--Development of natural resources infra structure within the region to include intensive agriculture, animal husbandry and diary development projects.

--Introduction of a better logistics vehicle with shorter turning radius, load carrying capacity and in built winterisation.

--Construction of roads and tracks to support the minimum envisaged deployments.

--Raising of yak units.

--Raising of local porter units.

--Development of an all weather helicopter for high altitude operation.

--Lighter winter clothing, for winter, equipment and tentage.

--Introduction of simpler unit and individual water filteration equipment.

--Development of a chain of caches on the Alpine huts concept.

--Palletisation of basic ammunition loads.

CONCLUSION

The logistics problem of conducting operation in the Eastern Himalayas cannot be equated to that of the other mountainous areas of the country as Jammu & Kashmir. Having suffered a severe setback a quarter century ago in this region, a blow which was as much an administrative failure as a tactical one, logistics assume added importance for consummation of operations in the area. We have now built up extensive experience in this region and can thus apply ourselves to solving the problem more realistically. An attempt is made in this paper to view the problem at the macro as well as at the micro level wherein the peculiarities of the area have been gauged and survivability

solutions devised.

The development of a local resources infra structure would be an ideal answer to some of the logistics problems of the Eastern Himalayas. For unlike the glacial regions of Ladakh this region has adequate potential for it. The spin offs of generating employment and evincing interest in the people of the region seeing its collateral benefits are tremendous. Logistics would thus not only prove beneficial to the army but also to the region as a whole. The requirements of the armed forces are such that at times it results in alienating the local population but their sensibilities have to be taken into account if lasting results are to be achieved. Thus special efforts need to be made to prevent disturbance of the peculiar culture and identity of the local populace.