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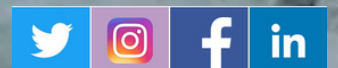
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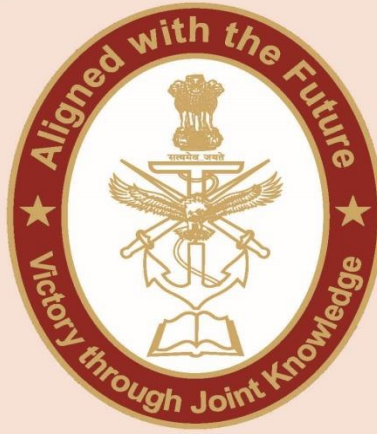
SURGING SURFACE INFRASTRUCTURE IN BORDER AREAS: NECESSITY AS WELL AS ASSET FOR THE NATION

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Lt Gen Rajeev Chaudhry, VSM (Retd) was commissioned into Corps of Engineers in Dec 1983. After serving for nearly 40 years, he retired on 30 Sep 2023. During his last assignment as DGBR, he accelerated the pace of work substantially to meet stringent targets post Galwan clash and worked to get an incremental budget allocation of 160% during last three years.

Abstract

Border Roads Organisation (BRO), had not been meeting its targets since its inception in 1960, but post Galwan clash the present Government put its concentrated focus on upgradation of border infrastructure. With focussed apex leadership and increased incremental funding, BRO accelerated its pace of work in mission mode to complete multitude of projects which provided a strategic edge to India over China during last three years at most crucial locations all along the LAC. There is a compulsive necessity to take into account all that what has been done and what more needs to be done to reduce the persisting road head differential along the Northern Borders for last 60 years. The subject matter has been studied in detail by the author who has been at the helm of BRO for three years bringing up desired changes to speed up the work and look ahead in future to provide necessary momentum to border infrastructure which is also improving the socio – economic standards of our people living there and not getting proper access to basic needs as well as many Central Government schemes since independence. All the research has been driven by author's experience with BRO and open source information available in print and electronic media.

Author has suggested number of recommendations focussing on financial and procedural reforms, streamlining of processes, modernisation of equipment, infusion of new technology and skill development of its cadre besides setting up of a central agency at National level to coordinate all the infrastructure coming up on borders and creating BRO Videsh to assist in establishing sub regional connectivity in friendly foreign countries through infrastructure development.

Roads in plains and roads in mountains are entirely two different activities and not adequately nurtured earlier thereby stunting progress of mountainous region and remote areas along Northern borders. This historical approach, characterized by a lack of focus on border infrastructure, resulted in inadequate road connectivity, hindering timely mobilization of troops and logistical support. Concerns that improved roads along the borders could potentially be exploited by adversaries led to a defensive approach effectively stalling the advancement and accessibility of these critical areas. Due to lack or absence of any major infrastructure in many border villages, the people were also adversely affected.

The current approach has been pivotal in transformation of Border Roads Organization (BRO) by enhanced budgetary support and sanctioning extremely ambitious projects. Today BRO has emerged as a cornerstone in the nation's defence architecture for developing these needs. ***Affectionately termed "Bro"(means Brother) by the Raksha Mantri Shri Rajnath Singh¹, this endearing nickname encapsulates the organization's pivotal function in strengthening India's border security and fostering the integration of distant regions into the national mainstream.*** Beyond its immediate strategic benefits, the BRO's work during past decade has ushered in a wave of socio-economic development in border areas. The infrastructure improvements have triggered the reverse migration, boosted trade, opened up new livelihood opportunities, and enhanced access to healthcare and education for the border communities. In the process, much needed connectivity is being made available to the defence forces.

Neglect to Nurture. BRO, since its inception in 1960, had been serving two entities which created considerable confusion in handling of the projects. The financial control was with Surface Transport Ministry, but its tasks were defined by the Defence Ministry. Such dual control created problems in the smooth functioning of the organisation which led to inordinate delays at times. Some positive changes are as under:

- **BRO put under MoD.** On 01 Jan 2015, a much needed decision was taken by the Government to put BRO under complete financial and administrative control of MoD to revive this ailing and beleaguered organisation.²
- **Departmental and EPC Mode.** BRO had been structured to undertake all its projects departmentally, which grossly limited its capacity to approximately Rs 3000 Cr per year, which was awfully inadequate. In 2017, it was decided that BRO could get projects executed through EPC (Engineering, Procurement and Construction) mode also in order to accelerate the pace of work.³ This was second major step to optimise the organisational capacity. Through this revolutionary decision, BRO has risen up from an expenditure of Rs 3000 Cr per year to Rs 12340 Cr in just last 10 years.⁴
- **Streamlining of Processes.** There has been constant improvement of procedures towards efficient functioning of BRO during last decade but major reforms happened when Raksha Mantri through his visionary approach, in February 2022, upgraded

the Administrative Approval and Expenditure Sanctioning financial powers of executives at all levels so the time is not wasted in looking up to the next level for decisions.

Galwan Valley Clash. BRO picked up pace but still there was significant road head differential between India and China along LAC and needed to be made up fast. ***The Galwan Valley clash between Indian and Chinese troops in June 2020 served as a reminder of the strategic vulnerabilities associated with inadequate border infrastructure.*** In the face of an increasingly aggressive China, the need for India to enhance its infrastructure along the LAC became compulsively evident.

Budget Surge Post Galwan. Prior to Galwan, the budget for Army roads was consistently around Rs 2000 Cr, leading to delays in ongoing projects due to cost and time overruns. The current government rose to the challenge and took optimal measures to enhance border infrastructure. This commitment has been evidently visible in subsequent budgets post Galwan, which saw an incremental rise of 160% for strategic Army roads. In a decisive shift, the interim budget of 2024-25 earmarked Rs 6500 Cr for strategic roads.⁵ By the fiscal year 2022-23, the total budget expenditure of the BRO reached a record Rs 12,340 Cr, covering all the work BRO undertakes for four other ministries.

This decision aims to reduce the "infrastructure differential" along LAC. Road is the backbone of all infrastructural elements. ***On BRO roads ride future developmental schemes of all the Central ministries and state departments.*** The development encompasses building helipads, airfields, bridges, tunnels, troop habitats, and other necessary facilities at an accelerated pace. The focus on enhancing infrastructure, surveillance, and military capabilities signifies a comprehensive approach adopted by the Government, aiming for a posture that can effectively counter any future misadventure by China. ***BRO's strategic focus on enhancing last-mile connectivity along the LAC has effectively indicated to China that India is no longer an opponent with lesser resolve but is rapidly emerging as a formidable nation on the global stage, both economically and strategically.*** This advancement aligns with its impressive economic growth trajectory. Moving from the 10th position in 2014 to 5th in the global economic rankings, India's economic ascent has been noteworthy.⁶ Moreover, forecasts by S&P Global Market Intelligence indicate a promising future, with predictions of India ascending to the 3rd position by 2030.⁷ This economic surge will offer more opportunities to India to enhance axial and lateral connectivities required by the defence forces.

Revamp of Inventory. Enhanced budgetary support helped BRO discard its old machines & equipment and significantly upgrade its inventory with the latest machinery including advanced excavators, wagon/crawler rock drills, and snow cutters, enhancing its operational readiness and efficiency. The strategic deployment of Chinook helicopters and other air lift assets have improved access and logistics support in challenging terrains of Ladakh, Uttarakhand and North East. In a move towards Atmnirbhar Bharat, a major policy decision was taken to sign a MOU with the Garden

Reach Shipbuilders & Engineers (GRSE) for the production of 60 Double Lane Class 70 modular bridges.⁸ ***These bridges, a first of their kind in India, are designed for rapid construction and are capable of supporting two-way traffic, significantly reducing costs to one – third compared to their imported counterparts.*** These are engineered to accommodate all kind of military equipment such as heaviest of tanks, artillery guns, and multi-axle load carrying trucks. To date, about 30 of these strategically important bridges have already been constructed at key locations along India's Northern borders, bolstering the nation's infrastructure and defence readiness. This was something which was needed by the defence forces for optimally utilising their capacities in an integrated manner.



Class 70 Double Lane Modular Bridge at Flag Hill

The accomplishments of the BRO are closely linked with the socio-economic progress of the country, heralding a transformative period in infrastructure development across roads, bridges, tunnels, and airfields. This comprehensive advancement serves to bolster India's defence capabilities while significantly improving access and connectivity across the nation.

Infusion of New Technology, Digitisation and Automation. Post Galwan, BRO has put in extraordinary efforts through infusion of numerous new technologies, after extensive trials, to accelerate the pace of work. BRO has also launched a pilot project to use steel slag for construction of roads.⁹ From planning, to contracting, to execution, the organisation has left the old mindset behind and adopted new methodology available. BRO has digitized all its roads and put it on GIS for ease of better future planning and integration with other ministries working in the same domain. Through use of 11 new softwares, specifically designed to meet BRO's ground requirements,

executives and staff are in better position to monitor progress of all its projects spread along land borders in 11 states and 3 UTs.



BRO is to use Steel slag for construction of roads

Transparency in Procurement. Demonstrating an exponential increase in GeM procurement, BRO has not only tripled its transactions on the platform during last three years but also pioneered the listing of essential construction materials like Steel, Cement, and Bailey Bridges. These advancements culminated in BRO achieving a Gross Merchandise Value (GMV) of Rs 1600 Cr within 11 months during the last financial year, a milestone that previously took six years to reach. The strategic utilization of GeM has yielded considerable benefits, including a 33% reduction in acquisition timelines, roughly 20% savings on costs due to reverse auctions, and an overall cost reduction of 15-18%. These savings have been reinvested into more projects, furthering economic prosperity.¹⁰ Additionally, the move has brought intangible benefits like minimized human interface, enhanced safety, and bolstered fairness and transparency in procurement processes. ***DGBR was invited as a sole speaker from Central Government departments to share BRO's GeM experience to enhance transparency, inclusivity, efficiency and eradication of corruption, with delegates of G20 nations on 01 March 23 at Gurugram.***

BRO's commitment and success in leveraging GeM have been recognized with prestigious awards, including the Silver Certificate for GeM procurement and the Gold Standard Certification for timely payments in the Central Govt Category for two consecutive years in FY 2021-22 and FY 2022-23.¹¹ In FY 2022-23, BRO set a record with a procurement of Rs 1853 Cr through GeM. The process since has been institutionalised.

Women Empowerment. BRO modified its policy for women officers on the 8th March 2021, wherein on that day, a transformative policy decision was taken to foster a

gender-neutral environment aligning with the Indian Government's "Nari Sashaktikaran" initiative. A woman officer was given the command of a Road Construction Company (RCC) responsible for Munshiyari to Milam glacier road in Uttarakhand's rugged Kumaon region. Another woman officer was given command for the construction of roads and bridges in the challenging Siang valley of Arunachal Pradesh. Following suit, a woman officer from Army was posted as Officer Commanding of an RCC in Aug 21 at Pipalkoti, Chamoli district, overseeing the development up to the Mana pass - India's second highest pass. This was also made into the first all women RCC where all three platoon commanders were also women officers as well as RCC doctor was also woman officer.¹²

Taking this initiative ahead, a woman officer of the rank of Colonel was appointed as Commander of a Task Force at Ziro in Arunachal Pradesh in Feb 23. She became first woman officer to lead a Task Force in BRO. In Jun 23, Col Ponung Doming was selected to head a Task Force at Hanle, Ladakh, which was shifted specially to handle some strategically very important BRO projects.¹³

The contribution of these women officers is paving the way for others to join and excel in BRO. Women empowerment in the BRO is more than a policy; it's a promise of participation, equality, and excellence. This progressive ethos within the BRO serves as a beacon, guiding India's journey towards a future where gender no longer defines capability or destiny.

Dignity and Social Security for CPLs. BRO employs approximately 90,000 casual paid labourers (CPLs) whose efforts are pivotal in executing the daunting tasks in inhospitable terrains. The organisation has provided an array of amenities designed to cater to both their professional and personal well-being. Prefabricated shelters, Porta Cabins, and Bio Toilets have been introduced to improve living conditions. Furthermore, the provision of Water Purifiers and Solar Lights enhances their day-to-day living conditions. Recognising the extreme weather they often face, the BRO has equipped CPLs with Super High-Altitude Clothing, while recreational facilities have been established to bolster morale, leading to increased productivity and the ability to work for extended periods.¹⁴

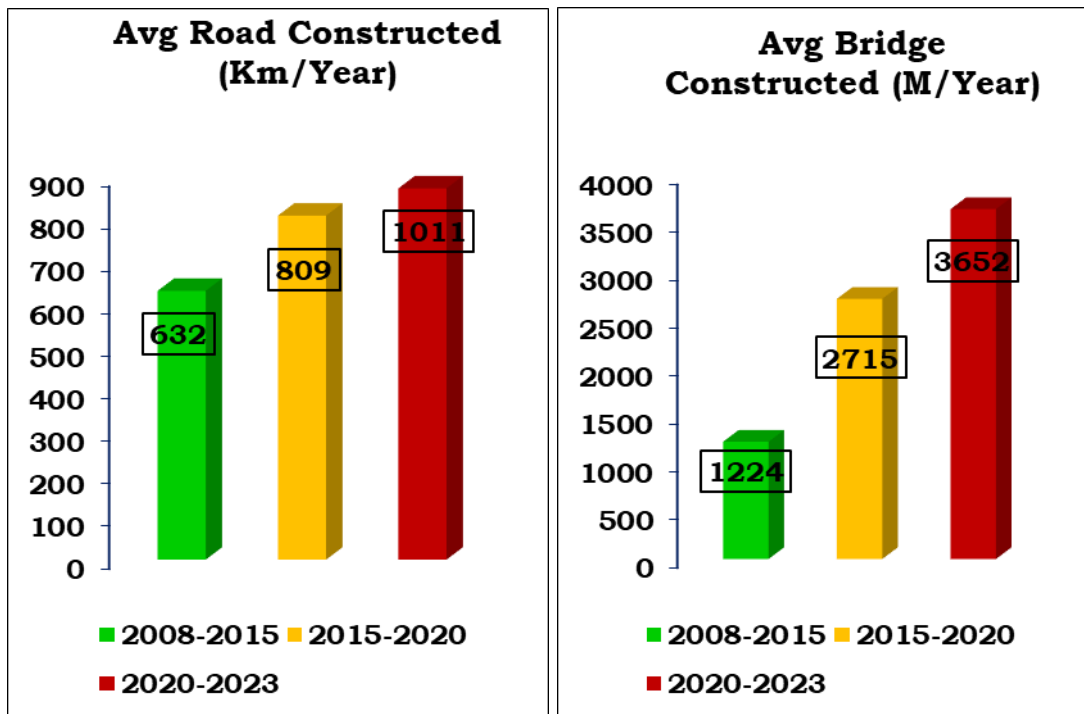


Hon'ble RM presenting Blankets to Local CPLs at Shyok Bridge Site on 28 Oct 2022

This comprehensive caring approach was bolstered by a landmark decision in January 2024, when the Raksha Mantri approved a term insurance scheme for CPLs.¹⁵ Additionally, in September 2023, a policy was introduced to repatriate the mortal remains of deceased CPLs to their native places and cover funeral expenses, alleviating the burden on their families. Also, Raksha Mantri has approved a proposal to waive the requirement of completing 179 days at the time of accident for the payment of ex-gratia lump sum compensation to CPLs working in BRO.¹⁶

This dedicated work force is the best example of providing direct jobs to the people of Border States where BRO is executing its projects. Besides direct jobs BRO is also generating numerous indirect jobs and employment of youth at multiple levels.

Road Network Expansion. The BRO has made monumental advances in constructing roads during last 10 years and the rate of construction has impressively increased as compared to yesteryears.¹⁷ This has been possible due to the revolutionary policy changes, increased budget, infusion of new technologies and cutting-edge leadership coupled together. A remarkable highlight is the creation of the world's highest motorable road in Ladakh connecting Chisumle to Demchok passing through the UmlingLa at a breathtaking altitude of 19,024 feet.¹⁸ This development facilities quick mobilisation of forces and resources from not only from the peace areas to the operational areas but also moving from one sector to another.



Bridging the Gaps. In bridging the gaps, BRO took a strategic decision in 2021 to make class 70 as its main stay bridge to enable all tanks, artillery guns and multi-axle load carrying vehicles to be taken to the forward most locations when needed, enhancing the mobility of troops and logistical support across challenging terrains.¹⁹ Noteworthy is the construction of the world's highest bridge at Saser Brangsa (15300 feet) over Shyok River in Eastern Ladakh, employing advanced materials to ensure durability in harshest of weather conditions. This bridge is an engineering marvel spanning a gap of 345 m and resting over seven piers each being supported by 47 micro piles.²⁰ The added feature of this bridge is that it has been constructed including planning, designing and contracting during a single working season during year 2023. The defence forces had their adversity initially which will get bridged with this approach. It will not only meet our current operational requirements but also those in future.

Tunnelling Achievements. The BRO's accomplishments in tunnelling are significant, with the completion of four major tunnels post Galwan, including strategically important Sela tunnel, which was inaugurated by Honourable Prime Minister on 09 Mar 24.²¹ This tunnel is the longest bi-lane tunnel in the world above 13000 feet. Presently work is on full swing on 10 tunnels and BRO is poised to take on at least eight more tunnels in near future for which planning process is near complete,²² out of which six would be higher than Mont Blanc (15771 feet) – the highest peak of Alps. Till now the world used to look with awe and admiration at mountain tunnels in Alps but the focus is sooner shifting to India when it comes to construction of tunnels at super high altitudes. 'All weather' connectivity is becoming a natural phenomenon not only for the defence forces but for the local population as well.

Airfield Development. The BRO's role extends to the construction and upgrading of airfields, with notable projects recently completed at Bagdogra and Barrackpore Airfields enhancing the operational capacity of the Indian Air Force in Eastern Sector.

BRO has made 21 airfields since its inception along Northern borders. The work is going on in full swing at Nyoma Air Base which will provide strategic edge to Indian Air Force over China and extend operational and logistic reach of Army in Eastern Ladakh.²³ By adopting new technologies and approaches, these efforts have moved forward, highlighting India's dedication to achieving widespread growth and demonstrating strategic resilience.

Accelerated Pace post Galwan. Post Galwan, the BRO intensified its efforts to develop border infrastructure, a move that can be seen as part of India's broader strategy to strengthen its position along the LAC. The BRO expedited the construction of roads, bridges, and tunnels. Projects like the Darbuk-Shyok-Daulat Beg Oldi (DSDBO) road, which enhances connectivity to far-flung areas along the LAC in Ladakh, received renewed focus. Simultaneously the alternate connectivity to DBO has also been established via Sasoma-Saserla-Saser Brangsa- Gapshan axis. Post Galwan, the road connectivity has been established to all forward most posts in Eastern Ladakh and a 121 km long road connecting Chushul-Dungti-Fukche-Demchok along the LAC is in final stage of completion. Also the work on Likaru-Migla-Fukche road in Chumar sector is on, making it the highest road in the world soon at 19400 feet.²⁴ With such road network coming up, now the reinforcements can reach at the point of conflict in fastest time frame, giving us an operational as well as strategic edge over China which was never thought of few years back.

The scale and speed that BRO has imparted to road construction in remote areas post Galwan has been unprecedented and a record 330 strategic Infrastructure Projects have been dedicated to the Nation in the last three years by Hon'ble Raksha Mantri.



Chinook Helicopters used to lift machines to create multiple attack points



TCC –Taksing road has changed the security dynamics in Subansiri valley of Arunachal Pradesh



Road from Gunji to Jolingkong is going to be a strategic game changer in Dharchula Sector

Putting Bharat on Global Infrastructure Map. BRO, an emblem of the Nation's engineering prowess and determination, has put Bharat on global infrastructure map by creating 10 world records and all during last three years.²⁵ Eight of these have been certified, whereas two are under process. Eight out of 10 of these records have been created in the harshest terrain of Ladakh. Today the Indian flag flies high with inexplicable pride on the highest road (19024 feet) in the world.



World's highest road – Umlingla (19024)

The journey of BRO is far from over, with the team poised to break more world records in the future. Demonstrating exceptional skills in various construction sectors, BRO is emerging as a source of inspiration within the global construction industry. There are four more projects, including world's highest road at Migla (19400 feet)²⁶, highest

tunnel at Shinkunla (15855 feet)²⁷ and world's largest 3D printed building complex at Chandigarh, in different stages of construction which are soon going to bring proud and cheer to each Indian.²⁸ ***The world records achieved by BRO are more than engineering marvels; these symbolize the human grit and resilience, cutting edge leadership and government foresight and support. The best part is that majority of these are dual use assets both for the defence forces as well as for the local population.***

Taming Zojila, breaking Mindsets. Ladakh remains cut off from the rest of the country during winters when both routes - one from Srinagar and other from Manali to Leh get closed. In an unprecedented move, BRO significantly reduced closure period of Zojila from traditional 160 – 180 days in past to 110 days in 2021, 73 days in 2022 and 68 days in 2023. This enhanced connectivity through Zojila Axis gave security forces an extended strategic reach through winters and saved Government exchequer approximately Rs 350 – 400 Cr per year for air maintaining troops deployed in Ladakh. Similarly other 26 major passes in the Himalayas were also either kept open throughout the year or opened much ahead of schedule, thereby enabling easier logistics build-up for the troops deployed ahead. This has led to operational and economic benefits, including significant savings for the Indian Army and local economies.²⁹



Zojila no more remains

Fostering Socio-Economic Growth. In its mission to enhance connectivity, the BRO has taken significant strides to extend road infrastructure to the most remote and previously inaccessible regions, thereby integrating some of the country's most isolated

areas with the mainland. A noteworthy achievement in this endeavour is the construction of a 180-foot bridge in Sanklang-Toong, Sikkim, on Tulung Chu road, affectionately termed the '**Bridge of Hope**' by locals. This infrastructure marvel has drastically reduced the journey for villagers to Saffo Village from a gruelling 56 km drive plus a 14 km trek to a direct route, symbolizing a tangible link to progress and opportunity.³⁰ The BRO's impact is profoundly felt in regions like Demchok in Ladakh, Jolingkong in Uttarakhand, and Huri Village in Arunachal Pradesh, where roads have connected the most remote villages to the main stream of the country. Border villages and people there are the flag bearers of the nation and the current focus needs to be continued.

The construction of the 278 km Hapoli-Sarli-Huri road in Arunachal Pradesh's Kurung Kumey district has asserted reverse migration in the region. Huri was air maintained since independence. The population of Huri village had dwindled from 200 to 49 as all the young people migrated to bigger villages or towns in search of better opportunities. After construction of bridge on River Kumey in Jun 2021 and the road in Sep 2021, the people returned to Huri.³¹ Today the population has gone upto 300, a primary school has been opened and a Primary Health Centre has come up there. ***Some of the old people had seen helicopters but never a vehicle in their lives.*** Moreover, this road has moved our security matrix much closer to LAC making it easier for our troops to reach the conflict points faster in case of any contingency. ***These developmental activities also strengthen our claim lines in such remote and forward areas.***



Hapoli- Sarli –Huri Road with bridge on river

Expanding its reach to the extremities of the country, the BRO recently connected the southernmost point of India with the completion of the North-South Road from Campbell Bay to Indira Point in Great Nicobar Island. This milestone achievement on 24 January 2023, epitomizes BRO's commitment to unifying the country's diverse landscapes and communities.³²



BRO Karmyogis at Southern most point of

Space Technology - A Game Changer. As BRO spearheads infrastructure development along India's Northern borders, the integration of space applications is proving to be a game-changer, propelling the organisation into a new era of efficiency and strategic capability. Traditional methods, while tried and tested, have met with numerous challenges, including inaccessible terrains, severe weather conditions, and logistical constraints. ***Space technology applications in BRO can streamline operations including planning, monitoring and communications from conception to completion.***

- **Fixing Alignments.** BRO has already started use of drones and LiDAR for preparation of the DPRs for its road projects. With the advent of high-resolution satellite imagery, BRO can conduct detailed topographical assessments with unparalleled precision. This data forms the foundation for designing routes that are not only cost-effective but also minimize environmental disruption. The imagery can reveal potential geological hazards, allowing BRO to proactively design mitigation strategies, which is particularly crucial in areas prone to landslides and earthquakes and prevent crucial disasters akin to Silkyara tunnel in Uttarakhand.³³
- **Monitoring Construction Progress.** Satellite imagery can be used to monitor the progress of road construction in remote areas, providing real-time updates and helping in better project management. As roads and bridges pave their way across the rugged landscapes, monitoring progress centrally can be a Herculean task. The satellites can provide the BRO with real-time imagery, enabling the oversight of projects from a bird's eye view. This not only ensures adherence to timelines but also allows for the rapid reallocation of resources to areas where progress may be lagging or where unforeseen challenges have arisen.
- **Advanced Weather Forecasting.** Further, the space technology offers advanced weather forecasting tools that can predict adverse weather events, giving BRO the much-needed time to prepare and protect both its personnel and projects. Such forecasts especially about avalanches can make huge difference to snow clearance operations undertaken by BRO at around 30 passes on Himalayan ranges.

- **Natural Disaster Management.** Space applications can assist BRO in predicting and managing natural disasters like landslides and floods, which often affect roads in mountainous regions. Moreover, in the event of disasters, satellite imagery aids in rapid damage assessment and informs the coordination of effective response strategies.
- **Satellite Communications.** Sturdy satellite communication networks can serve as the organizational lifeline, crucial for the integration and coordination of operations. Operating in the world's most isolated regions, BRO utilizes satellite phone communication to forge dependable connections between its ground teams and the Headquarters. Sufficient satellite phones have been procured for its remotely located detachments working on formation cutting and snow clearing tasks.
- **Dividends.** *BRO has already projected its demand for a dedicated LEO Satellite for pseudo real-time multi-sensor data acquisition for road alignment and earth work requirement planning to support the preparation of DPR along with support to track ground-based assets in remote locations.* By employing space technology to identify the most beneficial routes for infrastructure, the BRO can contribute significantly to the regional development. This connectivity leads to enhanced trade, improved access to education and healthcare, and a boost to tourism – all of which serve to integrate border communities more closely with the economic mainstream of the nation.

Way Ahead and Recommendations

- **Financial Reforms.** There is a need for further financial reforms in the BRO to ensure incremental fund flow and their efficient utilisation. This would involve greater budgetary oversight, improved financial management practices and better monitoring and evaluation of ongoing projects.
- **Modernisation of Equipment.** There is compelling need to revise existing archaic norms for authorisation of equipment and allotment for funds for procurement of machines to undertake ensuing works. Infact the power to decide the type of equipment and machines required to undertake the strategic works should be delegated to the DGBR to avoid delays in prevalent procurement cycle.
- **Infusion of New Technology.** The new technology and products not only enhance the quality of projects but also reduce time of construction and long term costs. There is a need to look at this aspect with open mind in the larger national interest while creating strategic roads and other projects.
- **Skill Development.** The BRO workforce needs to be equipped with the necessary skills to operate modern equipment effectively and adopt the latest technologies and construction methodologies to ensure effective execution of strategic works specially tunnels.
- **BRO Act.** BRO is an integral part of Indian Armed Forces under Article 33 of the Indian Constitution and BRO is also probably the only uniformed organisation which is not governed by an exclusive Act. GREF cadre is governed by CCS (CCA) Rules, 1965; whereas Army component of the organisation is dealt by Army Act, 1950 and Army Rules, 1964. It is strongly recommended that BRO Act should be

brought in to bring in more transparency and accountability in functioning of BRO towards Nation building.

- **One Border-One Agency.** There have been too many agencies constructing roads in the same space. Such arrangement creates confusion of duplication of connectivity due to lack of inter-ministerial coordination and final accountability of poor quality or speed of work as at time 3-4 agencies are allotted patches of stretch on the same road. It is recommended that there should be “One Border-One Agency” policy promulgated to have clear demarcated areas of operation. Till that happens, at least we must ensure “One Axis – One Agency” principle to ensure speed and accountability. Also roads built by BRO should not be handed over to state PWDs but continued to be maintained by BRO itself.
- **BRO Videsh.** There is an urgent need to create a foreign wing of BRO to enable it to undertake infrastructure projects in friendly foreign countries including ASEAN nations to establish sub regional connectivity to promote trade, commerce and strengthening diplomatic ties.
- **Border Infrastructure Management Authority (BIMA).** The government plans to set up BIMA for planned and comprehensive development of infrastructure on borders. One of the aims is to enhance the ongoing development of specific areas by increasing public-private partnership (PPP) and allocation of funds for completing works.³⁴ BIMA can be created initially as one of the verticals of BRO, because of a robust structure already existing at its Headquarters in Delhi. Subsequently it can be moved directly under MoD, to facilitate better and seamless integration with stakeholder ministries.
- **Stringent Punitive Actions against Defaulting Firms.** There is a compulsive need to review our systems dealing with defaulting firms involved in construction projects. Navayuga Engineering Company is one such example which was constructing the Silkyara tunnel for NHIDCL, where 41 workers got stuck for 17 days inside the collapsed portion. A couple of months before the Silkyara incident, 20 people were crushed to death after a girder launching machine collapsed on them at their viaduct project in Thane.³⁵ The firm was removed last year by MoD from a highly confidential naval project due to repeated delays. This is just one example where despite such major failures where lives are lost, the companies continue in the business.
- **Alternate Route to NH44.** The portion from Ramban to Banihal remains closed for at least 210 days in a year due to fragile rock strata in this stretch, for which NHAI may consider to focus on slope stabilisation of the hill side besides making small tunnels on this highway.³⁶ Beyond this we must consider to develop Jammu- Riasi-Sangaldan-Banihal route as an alternative approach to Kashmir valley to keep the traffic flowing into valley for critical strategic and economic reasons.

Summary

The journey of BRO is a testament to India's unwavering commitment to its border regions. It serves not only as a fortress of national defence but also as a beacon of development for remote communities. The past decade has witnessed a remarkable transformation in the BRO's capabilities, catalysed by financial empowerment and an

unwavering resolve to augment India's frontier infrastructure. ***If the funding continues at the same incremental rate, DGBR is given the status of Head of Department and further simplification of procedures along with some major organisational reforms is done at MoD, then the road head differential between India and China along LAC would get equalised within next five years. It is strongly felt that the output of BRO is yet to be optimised.*** As BRO continues to carve pathways through the mountains and valleys, it not only connects territories but also bridges the gap between ambition and reality, resilience and progress, duty and compassion. In its relentless pursuit to bolster India's defence capabilities and socio-economic development, the BRO has emerged not just as an organisation but as a robust symbol of India's fortitude, ingenuity and unwavering spirit which is **Connecting Places – Connecting People – Connecting Hearts.**

DISCLAIMER

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