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" *astyuttarasyam disi devatatma himalayo nama nagaradhirajah* |
purvaparau toyanidhi vigahya sthitah prthivya iva manadandah ||
- Mahavakavi Kalidasa virachita Kumarasambhavam(1 – 1)[1]"

Introduction

The verses mentioned above regard the "Himalayas" as the measuring stick of the earth.[2] It mentions that they possess a divine soul.[3] In India's context, the region presents a paradoxical situation. It stands as both a natural fortress while also being presented as a fragile frontier. It spans across 2,500 km, passing through multiple states and union territories. About 50 million people call it their home, and it accounts for about 1/3rd of India's total forest cover. It is the source of rivers that sustain billions of Indians. However, its steep gradients (being the youngest fold mountains on the earth), and geopolitical tensions revolving around it make it vulnerable to various factors. The divine primacy emitted by the region, as mentioned in the earlier verse,

demands that modern India safeguard this sacred sentinel. This protection is crucial against a multitude of factors that could create various types and levels of imbalances in the region. This article deals with selected issues of Terrorism and the Territorial Dispute, along with some insights on Tectonic fragility, Tourism, and the Technological gaps that the armed forces suffer from in this region. By integrating ancient reverence with contemporary challenges, this article underscores the imperative to fortify the Himalayas through sustainable policies and innovative solutions that honour its cosmic stature. Ultimately, addressing these interconnected vulnerabilities will ensure the enduring resilience of this guardian that has secured ecological harmony, national security, and cultural legacy for generations and for many more to come.

The Terror that troubles the Territory

The region spans across India's northern frontier. It presents a complex theatre of conflicts. The terrorism and territorial disputes, the 'trouble-causing twins', merge in this region. They thus create a persistent strategic vulnerability to the already fragile area. In Jammu and Kashmir (J&K), the terrorism is in almost all of its essence is proven to be of a cross-border, state-sponsored one by Pakistan.[4] It does so through proxy groups such as Lashkar-e-Taiba (LeT), Jaish-e-Mohammed (JeM), and Hizbul Mujahideen.[5] These terror groups often violate and exploit the Line of Control (LoC). They leverage the high-altitude passes in the region to attempt infiltration.

In the Northeast, the insurgency is a result of the tendencies of separatism, ethnic assertion, and resource control.[6] Groups like the National Socialist Council of Nagaland (NSCN-IM) and United Liberation Front of Asom - Independent (ULFA-I) operate across Arunachal Pradesh and Manipur.[7] The insurgents here impose extortion on infrastructure projects and agricultural estates. This creates an ungoverned space. It further amplifies operational challenges for security forces.

In the last two decades, more than 20,000 deaths, which included more than 15000 civilian and over 5000 security personnel, have been recorded in J&K (as of March 2019).[8] In 2024 - 25 (as on 22 Nov, 2025), more than 40 security personnel and over 50 civilians were killed in the region.[9] What remains a chronic issue is the displacement. Thousands of Kashmiri Pandits are still in exile, and thousands more are fleeing border villages due to escalations in cross-border firing.[10] In the Northeast, hundreds of casualties took place due to the ethnic violence between the Meitei and

Kuki - Zo communities. This has somehow facilitated insurgent activities. This is done by a systematic erosion of governance in remote valleys. These losses divert critical resources as a big chunk of the budget gets reserved for security. This also adversely affects the literacy rates, along with the healthcare access. Terrorism also inflicts a major blow to J&K's GDP. The curfews and labour disruptions have led to a decline in agricultural production.[11] Environmentally speaking, the militants have cut trees in forest areas in this ecologically sensitive zone for illegal timber smuggling.[12] Poaching of endangered species like hangul deer and markhor has also seen a significant rise in these zones.

Territorial disputes further fuel these insecurities along the Line of Actual Control (LAC) with China and the LoC with Pakistan. There are reports of China having established more than 600 "Xiaokang" border villages.[13] Out of these, an estimated 200 are said to be very close to the LAC.[14] These are reported to be well-equipped with 5G networks and dual-use infrastructure. This strategy for sure creates a daunting strategic depth. These are supported by multiple airbases and missile sites in the autonomous region of Tibet.

In war-fighting terms, these threats demand high-altitude warfare capabilities. The region is of oxygen scarcity, extreme cold and rugged terrain. Thus, a severe physiological and logistical burden is imposed on the troops. Operations at higher altitudes require specialised training. This is to ensure that the fatigue is effectively countered. Above 20,000 ft postings have the tendency to strain troop endurance. This underscores the need for real-time intelligence in dense forests and rugged mountains.

The technological gap is something that critically hinders operational efficiency. The broadband penetration is at a very subpar level. Power outages exceed multiple hours in many areas. In some the solar power output reduces significantly in winter. These lags further delay the necessary response during times of instability and disasters. This was evident in the Sikkim glacial lake outburst flood. The communication blackouts alone contributed to more than 50 fatalities.[15] In kinetic operations, the absence of effective connectivity causes issues with drone surveillance and AI-driven prioritisation. This reduces the response times in ambushes.

The Challenges in the Territory

The current section is an attempt at highlighting the challenges that persist in the region. These can be divided into two categories. One specific to troop movements that hinders their operational efficiency, and secondly, the ones related to governance that make it difficult to implement efficient policies to address the multitude of threats that exist in the region.

Troubles that the Troops face

- **Extreme Terrain & Climate:** The region is characterised by steep gradients, rugged terrain, oxygen scarcity, and extreme cold. These impose a severe physiological and logistical burden on troops.
- **Troop Endurance:** Operations at high altitudes can strain troop endurance and fatigue. This requires specialised training to counter these effects.
- **Natural Hazards:** The region records thousands of earthquakes annually. The majority of them exceed magnitude 4.0, which is a statistic that highlights perpetual strain that the crust experiences. Apart from these tremors, the steep and fractured topography results in secondary hazards, the landslides. Thousands of active slide zones scar the landscape, resulting in damaged roads, homes, and other critical infrastructure. These failures can be attributed to rapid glacial retreat, deforestation, and unchecked construction on unstable slopes. This leads to a situation where natural instabilities turn into human catastrophe. This devastating cycle is further amplified by the adverse effects of climate change. Warmer temperatures boost the permafrost thaw and glacial lake outburst floods (GLOFs). These scour valleys and destabilise the already fragile hilly regions. These destroy critical infrastructure like roads and bridges needed for logistics.
- **Connectivity Blackouts:** Subpar rural broadband and power outages can hinder operational efficiency. The absence of effective connectivity negatively impacts drone surveillance and AI-driven prioritisation. This leads to a reduction in response times during ambushes and kinetic operations.
- **Intelligence Gathering:** The rugged terrain and dense forests create a critical need for real-time intelligence. This is currently hampered by technological gaps. The conventional methods that deploy human factor is hindered by

physical constraints put on them by the adverse weather prevailing in the region.

The Challenges in Mitigation and Governance

Reducing (ideally eliminating) instabilities in the Himalayas is a race against 3Gs, i.e., Geology, Geography, and Governance.

- The Himalayas span nearly 2500km across twelve states. This makes it challenging to define a uniform policy. There is a dramatic variation in the local geology. While the western Himalayas bear thrust faults, the eastern sector contends with strike-slip motion. This asks for a tailored and not a ‘one size fits all’ approach.
- Second, there is a lack of enforcement ambition. Even though there is a visible rise in seismic compliance of structures being built, the issues with existing stock remain a major financial and logistical hurdle.
- Third, while the early warning systems achieve good landslide prediction accuracy well in advance, the rural connectivity gaps and low digital literacy mask these real-time alerts.
- Fourth, funding disbursal is slow-paced. The National Landslide Risk Mitigation Project (NLRMP) might have stabilised a number of slopes, but there are more that need more funding.
- Next, the climate-induced hazards raise the unpredictability factors. The everincreasing intensity of monsoon and the associated precipitation levels outrun the current hydrological models.
- Finally, there is a lack of interstate coordination efforts. Since disaster management is a state subject, it leads to fragmentation in data sharing. It further causes a delay in cross-border response during transboundary events. These governance faults, when combined with rapid tourism-driven, underassessed infrastructural development, create a cycle where short-term gains reduce the feasibility of long-term stability.

The Accomplished and Active Approach

The measures taken to address the above-mentioned challenges can be categorised into three parts, i.e., Kinetic and Tactical, Infrastructural, Logistics and lastly the ones related to enhancing the Digital gaps existing in the region.

Kinetic and Tactical Enhancements

- **Enhancing Precision Strike Capabilities:** BrahMos missiles and Heron TP drones are proven effective in neutralising key threats.
- **Surveillance Technology:** Implementation of "smart fencing" coupled with thermal imaging and anti-tunnel drones. These have led to the detection of multiple infiltration bids in 2025.[16]
- **Troop Integration:** Integration of high-altitude-trained security forces in areas like Siachen to mitigate fatigue-related issues.

Infrastructure and Logistics

- **Strategic Connectivity:** Construction of all-weather tunnels to ensure yearround logistics to war-prone areas.
- **Border Infrastructure:** The Border Roads Organisation (BRO) has completed 111 projects in 2024,[17] including the Nechiphu Tunnel for all-weather connectivity to the strategic Tawang region.[18]
- **Village Development:** Approval of the "Vibrant Villages 2.0" program with a budget of over Rs 6839 crores to strengthen border areas.[19]

Digital and Communication Upgrades

- **Fibre Connectivity:** The Bharat Net Phase III initiative has connected over 2 lakh gram panchayats with optical fibre to bridge connectivity gaps.[20]
- **Satellite Coverage:** The Digital Bharat Nidhi has allocated Rs 1,200 crore for low-Earth orbit satellites to ensure full coverage in the coming years.[21]

Way Forward

More can be done to ensure that the war-fighting efficacy is enhanced.

- Expansion of community policing to 100% village coverage would foster local intelligence networks
- Scaling up of Himayat 2.0 in order to train 1 lakh youth annually in advanced domains like AI, drone operations, and other related skills could bolster both employment and auxiliary support for operations.

- Organising Himalayan hackathons to train people in predictive technologies for landslides and infiltrations could prove effective in dealing with issues arising from the same.
- Bio-engineering with 'vetiver grass' (a plant used for erosion control, soil stabilisation, and water purification) across thousands of hectares has demonstrated an effective, low-cost, high-impact slope stabilisation.[22] It has deep roots that bind the soil. This aids in absorbing the monsoon runoff and eventually reduces erosion significantly.
- A policy that mandates a 100% seismic retrofitting in public infrastructure is the need of the hour. This can be backed by central subsidies along with public-private insurance pools. This would also lead to an ease in homeowner burdens.
- Community drills should ensure that the virtual reality simulations are integrated. An effective coverage of the same in the local language through apps and other such instruments can ensure a boost in participation.
- Reforestation with native species, along with a regulated quarrying, would help restore the protective vegetative mantle that has been lost during the widening of roads.
- A Trans-boundary data platform (TBDP) that is modelled on the SAARC Disaster Management Centre (SDMC) would be a welcome move. It would synchronise the early warnings across Nepal, Bhutan, and India.
- Finally, transforming landslide risk zoning into urban master plans and a strict enforcement of "no-build buffers" around the active faults can arrest reckless expansion.

An amalgamation of indigenous knowledge, complemented with cutting-edge forecasting and secured by stringent land-use governance, would go a long way. These would ensure that the Himalayas can effectively transit from a zone of 'perpetual peril' to that of a 'planned progress.

Conclusion

The Himalayas embody India's ecological lifeline, cultural heritage, and strategic significance. It spans over 2,500 km and houses millions of people, along with sustaining one-third of India's forests and rivers. The region, however, faces existential threats from various issues as mentioned in this article. These perils have left a heavy toll, accounting for thousands of deaths and displacements. Tourism, generating

millions of dollars, suffered thousands of cancellations post the April 2025 Pahalgam attack. This has affected J&K both financially and socially. China's 600+ Xiaokang villages, with many of them very close to the LAC, amplify the border tensions. Along with these, thousands of annual landslides and minimal rural digital access and technological penetration hinder the resilience and growth.

India's response has been a robust one, but there is a lot more to improve upon. An effective policy to address these gaps is the need of the hour. The way forward demands a Himalayan Livelihood Mission, complete community policing, and transboundary data platforms that can harmonise governance across the Himalayan states. By blending bio-engineering, AI forecasting, and seismic retrofitting, the region has the potential it needs to transform from one filled with perils into one with progress. Fortifying this sacred frontier will ensure ecological harmony, national security, and economic vitality for generations. The Himalayas can go from being a fragile relic to being an invincible guardian of India's soul.

DISCLAIMER

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