

"Ladakh on the Edge: Militarization, Environmental Degradation, and the Forgotten Crisis"

High in the Himalayas, Ladakh's starkly beautiful landscapes are facing an unprecedented environmental challenge. Recently, the region become a hotspot for geopolitical tensions, exacerbated by clashes between India and China. However, while the world's focus has been on military buildups and border disputes, an equally pressing crisis—the ecological fallout of such developments—remains under-discussed.

In December 2024, with the help of CIERP funding, I spent over a month in Ladakh (India's northern most administrative region. It is disputed between India, China and Pakistan), studying and documenting the ecological impacts of recent conflict in the region.



Ladakh's rugged, high-altitude landscape characterized by arid mountains, deep valleys, and unique geological formations. The region's harsh climate and fragile ecosystem make it particularly vulnerable to both environmental and anthropogenic changes. Photos: Minaam Shah

Fragile Ecosystems under Strain

Once a person sets foot in Ladakh, it is hard to ignore the steady convoy of military trucks. Carrying ammunition, food and other supplies to some 50,000 odd Indian troops that are deployed on the India-China border, they leave a trail of dust and ash while crossing the nearly 100 villages that make up the vast region of Ladakh.

Prior to the military conflagration in 2020, locals would hardly see a vehicle in months. But in recent years, their number has exponentially increased. All day, local children keep waving and running after the trucks in joy and exhilaration. However, besides these children, few locals share the same excitement.

“This [militarization] has wreaked havoc here in our villages. The dust and soot from the speeding trucks covers everything: our homes, our rivers and trees”, said Noren Stobdan, a local villager from Ladakh. Noren is one of thousands of Ladakhis who fear the ecological fallout of the brewing conflict in Ladakh and the ensuing militarization of the region. As the imprint of Indian military infrastructure expands, locals have complained that the fragile ecosystem of Ladakh is at risk, and no one is taking it seriously.



Indian military trucks on a highway in Ladakh, contributing to vehicular emissions in the ecologically fragile region. The heavy military presence not only impacts local air quality but also accelerates road degradation, further affecting the environment. Due to restrictions on photography in sensitive areas, capturing this image was challenging, resulting in a slightly unclear shot

In recent years, rapid militarization of Ladakh which has included building of new roads, tunnels and garrisons has also caused immense degradation of sensitive habitats such as alpine meadows, wetlands and high-altitude forests, which are home to several endangered species, including the elusive, black-necked crane.

“Just few years back, flocks of black-necked crane used to swarm our villages. But since the military has arrived, they have suddenly disappeared, said Rozang Lai, a 74-year village leader from Chushul. “They were such a sight to our sore eyes”, he added.

Concern for habitat disruption is also shared by local environmentalists like Sushil Pradhan, who blame both India and China for the unchecked building activities in Ladakh. He explained to me during the visit that the military activities disrupt the natural breeding patterns, feeding habits and migration routes of these vulnerable species, thereby threatening their survival.

Rozang Lai gave me an example of this while walking me through the rugged slopes that surround his village. “The antelopes used to freely roam around this whole area. But now the newly built roads act as a barrier for them and they don’t venture here anymore. Even the few ones who come get crushed under the military trucks”.



Local nomads in Ladakh, whose traditional way of life is increasingly threatened by military restrictions that limit access to grazing pastures. As mobility declines, many fear the gradual erosion of their nomadic heritage, raising concerns about cultural and ecological sustainability in the region.

A Geopolitical Flashpoint

The region of Ladakh is strategically situated at the intersection of three nuclear powers: China, India, and Pakistan. Its geographic location offers significant geo-strategic advantages to any country that controls it, especially given its role in overseeing the Indus River, the largest water source in the water-scarce Indian subcontinent. As a result, all three countries have staked territorial claims over the area, with each exercising control over certain parts.

Most recently, following the 2020 Galwan Valley clashes between Chinese and Indian armies, both countries have significantly ramped up their military presence in the region. On the Chinese side of the unmarked border, new highways, airstrips and railroads have been laid while India has announced 295 new projects worth \$1.2 billion along the LAC. It is also ramping up work on the railway link which includes the world's tallest railway bridge and the country's longest transportation tunnel.

In public addresses, both the Chinese premier Xi Jinping and the Indian Prime Minister Narendra Modi have equated infrastructure with national security. After the 2020 clashes, Modi vowed to triple spending on border infrastructure. The same year, Xi visited Tibet to inaugurate new railway lines leading to the Indian border. In fact, barely a week after I landed in Ladakh, Indian Prime Minister inaugurated a 4-mile-long Z-Morh tunnel in Ladakh that will provide year-long access to Indian troops to the troops. Worryingly, the dangerous hyphenation of national security and infrastructure has led border projects to escape the scrutiny of environmental concerns and oversights.

Such indifference to ecological concerns in Ladakh is not new. Most notably, it was also evident during the militarization of the Siachen glacier. Siachen is the world's second largest non-polar located in Ladakh and contested between India and Pakistan. Following its militarization in 1980's, the presence of military ever since has led to its rapid melting. In 2010, Ladakh experienced catastrophic flooding which led to over 200 deaths and left thousands homeless. As per findings, the flooding was primarily caused by the use of chemicals to melt ice by the armies at the same Siachen glacier.

During my conversations with locals, they fear similar fate due to the renewed militarization in Ladakh. "We already suffered a lot in 2010 and don't want to suffer again", said Rigzin Stobdan, a Ladakhi resident whose house was washed away during the 2010 floods. "I am not educated but can tell you, Ladakh is a very fragile land. Even smallest of human tinkering causes disaster here. We have seen it in the past. Trust me!", he warned.

Experts like Sushil Pradhan also concur that unrestricted presence of troops also threatens to raise the emissions in the region, which is already critical because of global warming. "There is an additional input of warming by the presence of huge armed forces, their machines and their garbage, which goes into the natural ecosystem itself and creates ecological imbalance," he said.

Before the 2020 conflict, the Indian side alone was emitting 3,00,000 tons of CO₂ for military operations in Ladakh. Clubbed with emissions from Chinese and Pakistani military activities, nearly 1 million tons of CO₂ was being emitted each year in this triangular junction. With the

troop deployment having nearly quadrupled since the 2020 clashes, the emission levels are likely to have spiraled as well.



A panoramic view of Ladakh town, a region that remains on the edge as geopolitical tensions and militarization pose ongoing risks to its fragile environment. The growing military presence and infrastructure development continue to strain the region's delicate ecosystem, highlighting the intersection of conflict and environmental vulnerability

Conclusion

Based on my interviews with both locals and experts, the unfolding crisis in Ladakh underscores a troubling reality: the environment is often the first casualty of geopolitical conflict, yet it remains the last consideration in policy decisions. The people I spoke with—whether villagers reminiscing about vanished wildlife or experts warning of an impending ecological collapse—made it clear that militarization is reshaping not just the physical landscape but the very relationship between Ladakh's inhabitants and their land. The steady march of infrastructure, justified in the name of national security, is gradually severing the deep ecological ties that have long defined life in the region. Worryingly, many people have started migrating from Ladakh to

other areas. Many have abandoned their traditional nomadic lifestyle as military restrictions have made pastures inaccessible.

However, both the Indian mainstream media and international media have largely neglected the ecological and humanitarian consequences of militarization in Ladakh. According to local accounts, this lack of coverage can be attributed to two key factors: the media's predominant focus on high politics and national security narratives, and the logistical challenges posed by Ladakh's remote geography, which limits journalistic access.

My visit to Ladakh, made possible through the CIERP grant, should serve as a curtain remover, revealing the often-overlooked ecological consequences of militarization in the region. While mainstream discourse predominantly frames Ladakh through strategic and geopolitical lenses, my fieldwork highlighted the pressing environmental challenges faced by local communities. The degradation of pastures, disruptions to traditional nomadic livelihoods, and habitat destruction underscore the urgent need for a more nuanced, ecologically centered approach to policy discussions on the region. The lack of media and scholarly attention to these issues further reinforces the necessity of shifting focus beyond security narratives to environmental sustainability. By documenting these ecological impacts, this research aims to set the stage for deeper academic and policy engagement on Ladakh's environmental vulnerabilities, ensuring that militarization's consequences are not merely assessed through strategic paradigms but also through their lasting imprint on the region's fragile ecosystem and local communities.

I am thankful to CIERP for funding my research. Academic and professional growth aside, the project supported by CIERP has proven to be a milestone for my personal growth as well. Travelling and spending time near the border of China, planning for lodging and transportation, interacting with locals and dealing with landslides are now part of my experiential learning and toolkit.
