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The La Trobe Asia Brief

Melting Opportunities

Managing climate change and conflict in the Himalaya

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Message from the Executive-Director

I am delighted to introduce this issue of the La Trobe Asia Brief, in which several experts from within La Trobe University and the wider academic community join forces to examine the complex interface between environmental stresses and conflict in the Himalayan region.

The Himalayan environment is sometimes compared to a "Third Pole", but it is also a dazzling patchwork of linguistic and cultural diversity. The natural and human ecosystems of the Himalaya are equally vulnerable.

The authors offer a number of considered policy recommendations that underline the importance of both global and non-governmental approaches to managing this fragile region.

This brief is also an example of La Trobe University's unique strength in the Himalayan region. Academics from a wide range of research interests such as Bhutanese tourism, Nepalese dentistry and native dialects have banded together to form a Himalaya Research Network at this institution.

La Trobe Asia is pleased to support such collaborations. I am sure you will agree that this policy brief is a thoughtful and timely contribution to the public debate.

Dr Euan Graham
Executive-Director

About the series

The La Trobe Asia Brief is a publication from La Trobe Asia, based at La Trobe University. This series provides a platform for commentary, research and analysis of policy issues that are of key importance in the Asian region. The work will feature La Trobe University academics working with collaborators based in the region. The papers in The La Trobe Asia Brief series are written for an informed audience and are ordinarily 3000-4000 words in length. Authors will be invited by La Trobe Asia to contribute to this series.

Photos

Front cover: Jaswant Garh War Memorial, Tawang, Arunachal Pradesh, India. The mountains of Tibetan Autonomous Region (PRC) can be seen in the background (Ruth Gamble).

Additional images: Ruth Gamble, Alexander E. Davis, Diana Heatherich, Gerald Roche, Emmanuel Keller, Anthony Maw, NASAEarthData

Back cover: Pilgrim at Yamdrok Tso Lake, Tibetan Autonomous Region (PRC)(Ruth Gamble).

Editor

Matt Smith
With thanks to Diana Heatherich, Euan Graham and Tom Barber.

The La Trobe Asia Brief #3

Listen to the podcast

La Trobe Asia's podcast, *Asia Rising*, covers news, views and general happenings of Asian states adn societies. You can listen to an interview with authors of this publication, discussing climate change and the Himalayas.

Ruth Gamble, Alexander Davis and Matt Smith recording an episode of the *Asia Rising* podcast on the topic of this brief.

Executive summary

Most people recognise the imposing, ice-capped peaks of the Himalaya. What they may not know, however, is the critical role that these mountains play in Asia's climate, hydrology, ecology, and geopolitics.

The mountains house the world's third-largest ice-store which stabilises global climatic cycles and feeds most of Asia's large rivers.

Three biodiversity hotspots and a long list of endangered species thrive among the rivers' headwaters, and downstream in South, Southeast, and East Asia. The rivers support nearly half the world's human population, and twenty per cent of its economy.

The mess of international border and ethnic disputes that dissect the mountains not only remain unresolved, but is also leading to ever-increasing state controls, militarisation, and competitive development.

All of these activities are intensifying ongoing environmental and cultural destruction in the mountains. Their consequences will not only be felt by the region's long-suffering locals, but, if left unchecked, they will also be experienced by the billions of people who live downstream.

Despite the mountains' regional and global importance, these multiple, severe, and intersecting threats do not receive the attention they deserve.

This situation and its consequences are so dire that this policy brief recommends the implementation of the following measures:

- In the short term, militaries in the Himalaya should abide by strict environmental protocols.
- In the long term, all relevant actors should work towards demilitarising the Himalayan ice pack.
- Indigenous communities should have a greater advisory role in regional governance.
- Language revitalisation programs should be implemented and local place names should be used, including the name of the world's highest mountain Chomolungma (Everest).
- ICIMOD (International Centre for Integrated Mountain Development) should be funded at a higher level by both its member states and internationally. The expertise of its specialists should be officially recognised, and they should act as expert advisers and interlocutors for local authorities.
- More significant linkages and support should be encouraged between Himalaya governance institutions and those in the Arctic and Antarctic.
- The Himalaya should be given priority by the Green Climate Fund, and the UNEP.
- Large Hydropower Dams built on geologically unstable fault lines near ice-packs should not be included with the UN's Clean Development Mechanism.

A challenge a millenia in the making

The term “Himalaya” means “Abode of Snows” in most North Indian languages. This term and variants of it have been used for millenia to refer to the snow and ice-covered mountain regions that separate the Indian subcontinent from the rest of Asia.

For most of this time, they have been viewed by lowland populations with distant reverence. Most cultures had some sense that they depended on these mountains for their livelihoods.

The rivers are part of the interconnected Greater Himalayan Watershed, which created the fan of fertile river plains that enabled the greatest agricultural and population concentration on the planet. This system depended on the delivery of water and silt from the mountains and, therefore, the conservation of the hydrological and ecological systems in the regions highlands.

Until the 1940s, the region was controlled by a shifting network of small states that often exercised only a loose authority. The region’s large empires, primarily the Chinese and the British but also Russia’s, viewed the mountains as borderlands. They marked out lines that dissected the mountains on their maps but rarely ventured into them.

After the Second World War, however, the region’s newly decolonised states scrambled to assert actual control over the sites that their imperialist predecessors had claimed cartographically. This scramble for control led to a mess of claims and counterclaims that stretched across the Himalaya for 2400 kilometres from Afghanistan to Myanmar.

Since the 1950s, only Nepal and China have successfully resolved a border dispute, coming to an agreement in 1961.

Pakistan and India have fought three wars over the disputed territory of Kashmir. They both also claim the Gilgit-Baltistan region north of Kashmir, which is administered by Pakistan. Since 1984, The two countries have heavily militarised the Siachen glacier, considered the highest battlefield in the world. India and Nepal continue to negotiate some parts of their shared border.

China and India both claim the Aksai Chin region, a sizeable high-altitude desert between Ladakh (India), the Tibetan Autonomous Region (China), and Xinjiang (China), which is administered by China and claimed by India. In the east, Arunachal Pradesh is administered by India and claimed by China, appearing on Chinese maps as Nan Tsang (South Tibet). Bhutan and China also have a border dispute.

India and China fought a war over the east and west sections of their border in 1962. The 1962 war was short, but tensions have remained. Since then, China (1964), India (1998), and Pakistan (1998) have all become nuclear-armed states.

The normalised state of tension between India and China escalated in 2017 in the Doklam standoff, when China tried to wrest a piece of high ground on the China-Bhutan border from Indian troops. In early 2019, tensions increased in the Western Himalaya after a terrorist attack on the Jammu-Kashmir highway, and the Indian military’s retaliatory airstrike in Pakistan-occupied Kashmir.

India has subsequently pursued an administrative reorganisation of the section of the region they administer, Jammu and Kashmir (J&K), effectively placing the region under New Delhi’s administrative control.

Indian soldiers boarding ferry boats on the Brahmaputra River in Guwahati, Assam.

Mount Kailash in Western Tibet is sacred to Hindus, Buddhists, and the local Bön religion. The sources of the Indus, Sutlej, Ganga, and Brahmaputra Rivers are all found in close proximity to it.

The rising tensions between their powerful neighbours have placed Bhutan and Nepal in difficult situations. They are the only remaining independent Himalayan nations after China annexed Tibet in 1950 and India incorporated Sikkim into its territory in 1975 through a referendum. China and India only mutually recognised each other’s rule of these two former nations in 2003, and they still dispute the Sikkim section of their shared border.

These large, plains-based states have also struggled to resolve internal disputes with the mountains’ minoritised and dispossessed ethnic groups. Notably, the Himalaya is home to the Kashmiri, Tibetan, and Bodo sub-national movements and both the Indian and Chinese national governments have suppressed local uprisings by these groups. Kashmir is heavily militarized and the Tibetan Autonomous Region within China is closely monitored to prevent popular unrest. China’s Belt and Road development plans in Nepal and Pakistan have exacerbated regional tensions as well.

Geopolitical friction has led to regional militarisation and competitive development. As many as a million troops can be stationed across the mountains at any one time, and networks of large infrastructure projects (including roads, hydropower projects, airports, urbanisation, mining, factories, and tourism facilities) are being built to—at least in part—solidify territorial control. This fast-paced development is combining with climate change and the increasing air pollution drifting up from the plains, placing the mountains natural systems under intense duress.

The vast majority of international political analyses of the Himalaya have — perhaps understandably — focused on the border disputes, the potential for war, or even a catastrophic nuclear conflict. But the interlinked environmental and cultural destruction exacerbated by excessive militarisation and intensive, unchecked development present a more pressing threat to people in the region.

The region’s environmental and cultural diversity combined with its colonial history have made it a difficult site of negotiation for the region’s sprawling and heterogenous states, leading to its unresolved political status. This geopolitical situation has also made it difficult for these nations to work together to stop the degradation of this sensitive region, and to mitigate and adapt to climate change.

This status quo is difficult to sustain politically, economically, environmentally or culturally. As a solution, we propose that a series of international protocols be adopted that recognise the global significance of the Himalayan ecological zone and the importance of community-led efforts to its conservation.

In the best-case scenario, in recognition of the vital climatic, hydrological, and ecological role the Himalaya plays in Asia, it should be managed by an inter-governmental organisation whose goal is the demilitarisation and conservation of the region. If this is not possible, we argue that there should at least be international protocols that govern behaviours that impact the environment, cultures, and societies in the region.

Making the Himalaya: environment and diversity

Tensions in the Himalaya are not a new phenomenon, but for the majority of their 50-million-year history have been geological rather than geopolitical. These tensions were created when the Indian sub-continental plate slammed into the Eurasian plate. The two plates have been pushing each other skywards since; the Himalaya is still rising, and the region remains seismically unstable.

The rise of the Himalaya and the adjacent Tibetan Plateau changed Asia's geography and climate. Their primary contribution to this change was the creation of the world's largest interconnected watershed.

The Great Himalayan Watershed stretches from Pakistan, through South, Southeast, and East Asia to northern China. It is fed by the monsoon climate cycle, which the mountains help create and moderate. They block rising, moist air coming off the oceans, and circulate it back onto the lowlands, making monsoonal Asia much wetter than it would be otherwise.

They also store freshwater for hotter, drier periods. Some of the Monsoon precipitation falls in the mountains as snow. Over the millennia, this precipitation has created the world's third-largest ice accumulation, a "Third Pole," after Antarctica and the Artic.

Each spring, some of the snow and ice melts, feeding perennial rivers and moderating the climate. Many of Asia's major rivers descend from these mountains, including the Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze and Yellow Rivers. The spring melt recharges the groundwater of these river systems, which one-fifth of the world's population directly rely on for drinking water and agriculture.

Billions more depend on the rivers indirectly, as their waters are used to grow monsoonal Asia's food, generate its energy, and run its industries.

But the latitude of the Himalaya (on the 30th Parallel North, along with the Sahara Desert and Texas) and its proximity to the planet's most densely populated regions make it particularly vulnerable to climate change, pollution and other forms of human degradation.

These mountains have created the environmental conditions that support dense populations, but these populations are now threatening their mountainous life-support system in a variety of ways.

One-fifth of the world's population directly rely on the Himalaya for drinking water and agriculture.

The only organisation that represents an international response to the Himalayan environmental crisis is ICIMOD, a regional intergovernmental scientific and sustainable development learning and knowledge sharing centre.

One of ICIMOD's recent studies stated that at least one-third of Himalayan glaciers would disappear by the end of the century even if countries entirely curb their greenhouse gas emissions by 2050.

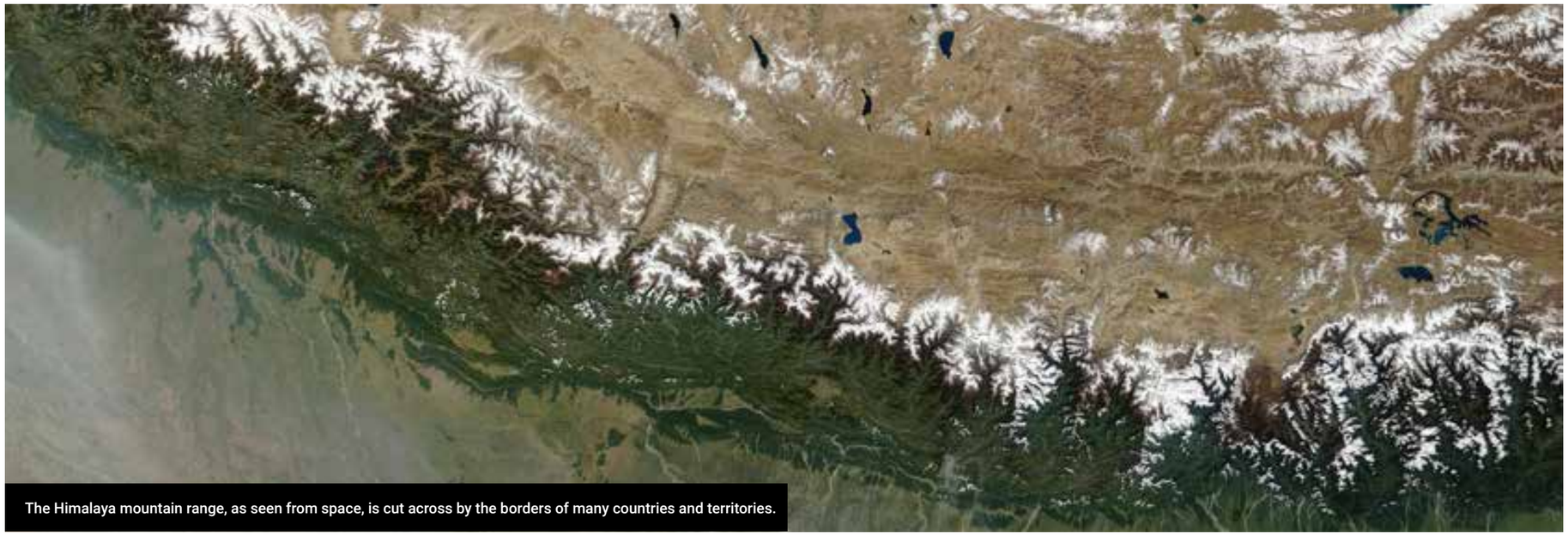
This change will lead to the drying of critical rivers and groundwater sources. It will, furthermore, intensify climate change, making it more likely that the region experiences extreme weather events rather than the seasonal rains.

These drastic changes are not just problems for the future. The region's climate and environment are changing now. The glaciers are already shrinking. As they shed water, and precipitation intensifies, the region is experiencing more landslides, rainy-season floods, and dry-season droughts.

The effects of these changes are not only environmental. They have already caused economic problems and migration. As these changes intensify, we can expect them to spread further downstream and create more economic issues, conflict, and mass migrations. As it stands, more than 30 per cent of the people living in the countries adjoining the Himalaya do not have access to enough food and 50 per cent experience malnutrition. Further changes in their climate and environment will make them even more vulnerable.

Himalaya by the numbers

- 15,000 glaciers and the world's 3rd largest ice cap
- Source of Asia's 8 largest rivers (Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze, and Yellow)
- 14 mountain peaks over 8,000 metres, including the world's highest mountain, Chomolungma (Everest)
- 4 biodiversity hotspots
- 163 globally threatened species including the snow leopard, red panda, clouded leopard and takin
- 50 plus languages and cultural groups



The Himalaya mountain range, as seen from space, is cut across by the borders of many countries and territories.

State-making and borders in the Himalaya

The rise of the Himalaya helped create unique circumstances for the people who lived among them, as well as effects on the broader Asian continent. The 60 million people of the Himalaya and adjacent Tibetan Plateau speak over 80 languages. These communities diversity and the difficulty that pre-modern lowland conquerors had crossing the mountains meant that the region became peripheral to the two plains-based imperial projects: British India and Qing China.

With the formalising of the Raj under the British Crown in 1858, India's political geography became a patchwork of polities. Himalayan kingdoms, such as Sikkim, Nepal, Bhutan, and Tibet, were on the outskirts of this system. Others, such as Kashmir (which by then included the nearby region of Ladakh), became princely states of British India.

During this same period, the Qing rulers continued to claim Tibet (which by some of their estimations included Sikkim, Bhutan, and Ladakh) despite maintaining only a nominal presence there. Indeed, the empires were able to make overlapping claims in the Himalaya because, for most of the 18th and 19th centuries, their claims were more abstract than actual.

The British push into the Central and Eastern Himalaya began in the mid 19th century when they forced unequal treaties on the Gurkhas in Nepal, the Bhutanese, and the Sikkimese (from whom they annexed Darjeeling and Kalimpong).

For the next fifty years the Tibetans continued to claim allegiance to the Qing Emperor. It seems this was primarily to keep the British off the Plateau, as for hundreds of years, there were no more than a handful of Chinese in residence in Tibet at any one time. Apart from Darjeeling and Kalimpong, on the ground, the rest of the Central and Eastern Himalaya retained its autonomy.

In the late 19th Century, the declining Qing state and the progressing British began to trade insults and expeditions across the mountains. In 1904, the British sent Francis Younghusband (1863–1942) on a military expedition into Tibet to force it open for trade.

A few years later, the Chinese allowed the Sichuan-based official Zhao Erfeng (1845–1911), known locally as "Butcher Zhao," to invade Tibet and set himself up as a ruler there. He was beheaded in Sichuan after the Qing Dynasty fell in 1911, and the Tibetans declared themselves an independent state. But the tensions between the British, Tibetans and Chinese were carried over to the new Chinese Republican Government. A few years later in 1914, the British convened the trilateral Shimla Conference to discuss mountain borders.

At the end of this conference, the British and the Tibetans bilaterally established the McMahon Line as their border. The Chinese refused to sign the agreement or accept its outcome. They came to view the McMahon Line as another of the humiliating treaties Western colonial powers had forced upon them, like the post-Opium War treaties and the ceding of Hong Kong.

When the People's Republic of China (PRC) was established in 1949, it continued the Republican policy of demanding the renegotiation of these unfair treaties. By contrast, when the Republic of India was formed in 1947, it treated British controlled territories as its legitimate inheritance. This difference in approach has underpinned the seven-decade dispute between Asia's two largest states.

While they have not agreed on the border, India and China have approached the Himalaya in similar ways. Both countries have pursued integrationist policies and prioritised the states' territorial claims over the autonomy of the region's diverse ethnic groups. These groups' relatively small populations and minority status have meant their voices are rarely heard in national politics.

Zhao Erfeng, led military campaigns throughout Kham (eastern Tibet), eventually reaching Lhasa in 1910, earning the nickname "Zhao the Butcher" in the process.

The renewed emphasis on centralised and uniform governance by the current leaders of both China and India, President Xi Jinping and Prime Minister Narendra Modi, have intensified this disenfranchisement. Both leaders have repeatedly sidelined local environmental and participatory concerns in the interest of integration and national development. Their duelling nationalist development programs privilege economic growth and interventionist infrastructure over local concerns and community autonomy.

In August 2019, for example, the Indian government overrode a longstanding special provision banning commercial mountaineering on the world's third-highest peak, Mount Khangchendzonga in Sikkim. The government's reasoning for this was that commercial climbing would bring economic benefits to the remote state. Local resistance on the grounds that Khangchendzonga is a sacred mountain that should not be climbed was ignored. The Indian government has also pushed ahead with several large hydro-electrical projects in the region despite local opposition to them.

The Chinese government's rapid transformation of the ecologically and seismically sensitive areas of the Himalaya they control has been even more profound. This development includes the largest cluster of hydropower dams ever built on the upper reaches of Himalayan rivers, the construction of large mines, plateau-wide train networks, and the rapid coerced urbanisation of minority groups. All of this has caused cultural and linguistic loss as well as the degradation of previously human-managed ecosystems.

It is also notable that most of the large-scale development programs undertaken in the Himalaya in the past few decades have been at least partially state-funded. Private equity and locally funded projects have been rare. This push for integration and state-making has been intensified by the long-term militarisation of the unresolved border and internal political unrest in the minority regions of Tibet, Xinjiang, Northeast India, and Kashmir.

The state-backed push to develop the mountains is relatively recent. It has been enabled by technological development and the increasing wealth of both India and China. As capacity within both countries has grown, so has their competitiveness. What is more, they have both exported their technology and funds to projects in the region's smaller countries. China is backing development projects in Himalayan Pakistan and Nepal, and India has underwritten Bhutan's hydropower expansion.

All of these conditions together have resulted in a new normal in which macro-nationalist interests dominate the conversation, drowning out urgent local demands to address the region's unfolding environmental emergency.

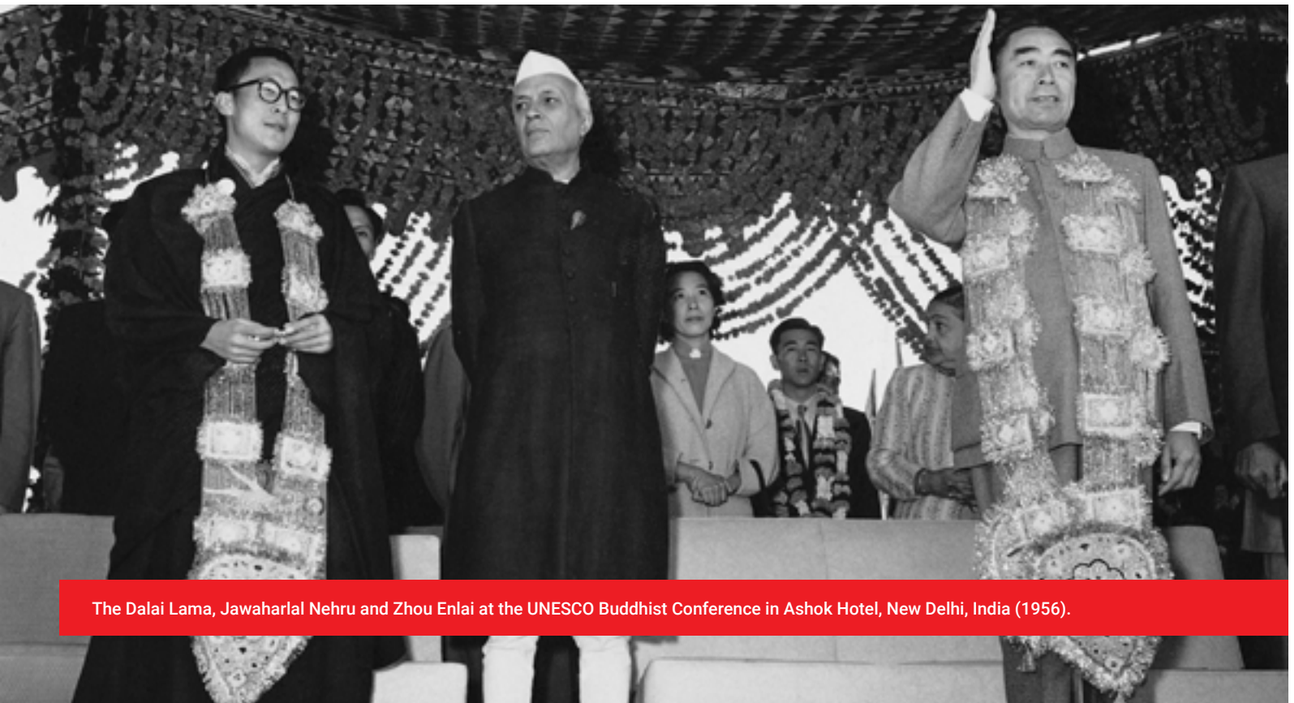
Decolonisation and bordering the Himalaya

The decolonising grab for territory that followed the Second World War left the Himalaya geopolitically unstable. Not only were its borders unresolved, but regional states' historical claims to territory were contested, and the region's complex ethnic make-up added to its destabilisation.

The newly formed PRC annexed Tibet and India claimed all land south of the McMahon Line. After years of difficult religious tensions with the new PRC government, the Dalai Lama, who was the secular and religious leader of Central Tibet, fled to exile in India. He was followed by approximately around 100,000 Tibetan refugees in the following three years.

The Indian Partition also helped create the current geopolitical instability in the Himalaya. Partition split the Western Himalaya between India, Pakistan, and China, and led to a war between India and Pakistan over Kashmir. The creation of Eastern Pakistan (now Bangladesh) left only a thin piece of land—the "chicken neck"—linking Northeast India to the rest of the country.

Nepal, Bhutan, and Sikkim were able to maintain or increase their international identities in the postcolonial world order. But Sikkim's protectorate relationship with India and its position near the chicken neck put it in a particularly precarious position.



The Dalai Lama, Jawaharlal Nehru and Zhou Enlai at the UNESCO Buddhist Conference in Ashok Hotel, New Delhi, India (1956).

India's first Prime Minister Jawaharlal Nehru quickly began promoting the idea that the Himalaya was the "natural frontier", both culturally and geographically, between India and China. With this formulation, small Himalayan states, Himalayan peoples, environments and resources were subjected to the 'national interest' of the larger Indian, Chinese and Pakistani States.

Nehru reached out to the Chinese leadership, seeking to engage them on Panchsheel, or five principles of peaceful coexistence, including mutual respect for territorial integrity.

In 1962, China invaded India across the McMahon Line in Ladakh and the Eastern Himalaya. China advanced into India-controlled territory and then withdrew. But the invasion transformed Indian foreign policy. From this point on, India has viewed China as a threat. China's subsequent links with Pakistan have only deepened this narrative.

India's third prime minister—and Nehru's daughter—Indira Gandhi centralised power in New Delhi during her decades-long tenure. She had a reputation as a foreign policy 'realist', who argued that the protection of India's territory was not only necessary but also the logical continuation of anti-colonial foreign policy.

In 1975, she incorporated Sikkim into India against the backdrop of continuing geopolitical tensions with China. In the same year, she worked with Kashmiri leader Sheikh Abdulla to produce the Kashmir accord, which strengthened India's position in Kashmir while maintaining a degree of autonomy for Kashmir.

But many of the unresolved tensions in the Himalaya remained. There were uprisings against Chinese rule over Tibet in 1989 and 2008. There were a whole series of ethno-nationalist movements in Northeast India (Tripura, Meghalaya, Mizoram, Manipur, five different groups in Assam), and movements demanding separate states by the Gorkha in Darjeeling, and the Boro near the Bhutanese border.

Within Nepal, there has been a longstanding agitation by the Madeshi people of the lowlands for autonomy, and the decade-long Maoist insurgency became a proxy for tensions between China and India. Furthermore, the tensions between China and India along the border have led to a long list of skirmishes in 1967, 1987, 2013, as well as the 2017 standoff over Doklam in Bhutan.

The tensions over Jammu, Kashmir, and Ladakh have not only continued but recently escalated. In August 2019, the Indian administration repealed Article 370 of the Indian Constitution, undoing a longstanding Constitutional guarantee of Jammu and Kashmir's (J&K) special status within the Indian Union.

At the same time, it bifurcated J&K into two centrally administered union territories: Jammu & Kashmir and Ladakh. The move was celebrated in some parts of Ladakh, which have long wanted separate governance from J&K. But there has been some disquiet that the new Ladakhi Union Territory will not have a legislature and be ruled directly from New Delhi.

New Delhi's actions in J&K, the Pakistani government's direct rule of Pakistani-administered Kashmir, and the Nepali government's interference in the free press all point to a worrying trend in Himalayan politics: the consolidation of state control at the expense of minority rights and civil society.

This consolidation is particularly evident in the Tibetan regions of the PRC, where the central Chinese government has implemented unprecedented social controls on most aspects of its residents' lives. The centralisation of power and the suppression of dissent limits local voices in decision-making processes and is detrimental for the diverse peoples of the Himalaya and environmental governance.

Direct rule enables central governments to develop hydropower projects, for example, in spite of local resistance to these projects for cultural and environmental reasons. In Kashmir, India's direct control of the region may enable the fast-tracking of the eight hydropower projects under consideration in the state. There had been local protests against some proposed dams, but the nationalist rhetoric that Kashmir must be integrated into India means that any opposition to these dams will be cast as anti-national. This same strategy of deeming anti-dam protests as anti-national has also been used in Pakistan, Nepal, China, and Bhutan.

Along with the repeal of Article 370, the Indian government has also removed Article 35A from the Indian Constitution. Article 35A prohibited people from outside J&K from buying land within the state. This will allow major industrial and commercial conglomerates to purchase property in the western Himalaya. Continued unrest in Kashmir may forestall wholesale changes there, but Jammu and Ladakh are likely to see rapid changes in land tenure and even more development. Given that Ladakh is a sensitive border region, most of this activity will either be coordinated with the military deployment in the region or service it.

Indian soldiers in Pahalgam, Kashmir, India.

Finally, given that increasing government control in these regions is generally unpopular, states that seek to do so often need to employ extra military personnel to do it. In places like Kashmir and Tibet, troops are deployed for dual purposes of securing the border and controlling local populations. The increasing number of troops in the mountains further stresses the region's fragile, alpine environment. India, China, and Pakistan are all building new infrastructure, partly to facilitate troop movement around these disputed borders. These troops also need energy and other resources that are difficult to acquire and have led to a dependence on imported fossil fuels such as diesel and coal. Their biological waste is destabilising local hydrological and ecological systems and their carbon pollution—mainly the soot produced from low-grade coal and diesel that coats glaciers — is intensifying local climate change.

Sometimes, national governments have even conducted large-scale, environmentally damaging projects to make life at high-altitude more appealing to their soldiers. In Nagchu in the Tibetan Autonomous Region, for example, the government spent millions of dollars melting the permafrost to plant a high-altitude forest that would make the stationed Chinese soldiers feel more at home there.

The Lhasa-Chengdu Railway is being built through the mountainous Tibetan region. In this photograph, the construction crosses in front of the Zangmu Hydroelectrical Dam.

Competitive infrastructure building and the Himalayan environment

As direct control and militarisation have intensified in the region, so has the rate of unchecked development. The roads, dams, train lines, new urban centres, and factories that were initially constructed to enable the region's military build-up have also encouraged resource extraction and tourism.

In India, the Border Road Organisation (BRO) is responsible for building infrastructure in India's border states. This institution is part of India's military and, therefore, prioritises military over civilian needs. Train lines, bridges, and tunnels have been built in the Indian controlled regions, but they have tended to focus on getting troops and tourists in and out of the region, rather than connecting the people of the area to goods and services. The difference between Bhutan and Nepal's road-building programs and these programs is marked: these states have prioritised roads that connect the people of the mountains, rather than connecting the mountains to the plains.

This trend is also evident in China and Pakistan, where infrastructure is being developed for the benefit of large populations "downhill" rather than the people of the region. Both nations' railway and road networks are set up to grant access to the mountains to bring in tourists and military and extract resources.

Perhaps the most unequivocal evidence of this exploitation of the mountains is the hydropower dam rush that is playing out across the region. All countries of the Greater Himalayan Watershed are energy starved, and all want to exploit the mountain's hydropower potential. According to ICIMOD's Hindu Kush Himalayan Monitoring and Assessment Programme, there are currently 550 hydropower projects either built, under construction or planned in China, India, Pakistan, and Bhutan. These projects are concentrated in the Indus, Brahmaputra and Yangtze River Basins.

The potential issues are numerous. These dams are being built in fragile and extreme environments. Rain flows through the rivers in surges, and in winter the water in some dams can freeze, threatening the infrastructure and making the hydropower turbines inoperable. Climate change will only intensify the region's climatic extremes, creating Glacial Lake Outburst Floods which occur when melting water at the base of glaciers burst through earthen barriers and cascade down valleys. These are becoming more regular and more deadly every year. None have interacted with a large dam to date, but it is only a matter of time.

It should also be remembered that the whole Himalayan range is seismically active. If a massive earthquake were to make a direct hit on a dam, the consequences could be catastrophic. Even small earthquakes or a rainstorm can cause landslides that create debris dumps in dams. A large earthquake could prove disastrous. After the Wenchuan Earthquake of 2008, Sichuan's largest hydro-electrical dam, Zipingpu Dam came perilously close to collapsing and creating a devastating flood.

The possibility of earthquake-caused dam collapse is further intensified in the Himalaya by the way these dams are being built. Instead of building single dams on tributaries, state-backed hydro-electrical companies across the Himalaya are choosing to build cascading dam systems on primary river channels. Some of these are funded through international financiers such as the World Bank and the UN's Clean Development Mechanism. Any disaster on these new projects will create a series of domino-like outbursts.

Limited, small, locally-focused hydro-electric projects could be an ecologically sustainable way to meet the Himalaya's energy needs. But the current race to build mega-dams across the Himalaya is neither sustainable nor environmentally cautious. Competition rather than cooperation is, furthermore, leading to the creation of multiple, competing dams on either side of borders, and producing a zero-sum game for water resources which is ultimately unwinnable for all sides. Furthermore, Himalayan topography places states which are further downstream, such as Myanmar and Bangladesh, in particularly difficult positions, as it gives India and China direct control over their water supplies. The Indus, Brahmaputra and Mekong Rivers are prime examples of this race to stop water getting to the bottom. China has been known to use this advantage over downstream countries as leveradge by with-holding water flow information in its arguments with India. But India, Nepal and even Bhutan have also been known to put their national interests above proper watershed management.

The recent rise in tensions in Kashmir has, unfortunately, also exemplified this tendency. Following the exchange of verbal hostilities between India and Pakistan after the Indian government repealed Article 370, the Indian Minister for Irrigation, Gajendra Singh Shekhawat, claimed India now had greater leeway to limit the supply of water to Pakistan via the Indus River. In doing so, he was using one of the world's most venerated water-sharing treaties as a bargaining chip with Pakistan. The Indus Waters Treaty has been in operation since 1960 and even operated in wartime, governing water usage between upstream India and downstream Pakistan. This nationalistic posturing has invited sharp responses from Pakistan and is likely to undermine the arrangement.

Competitions like this have no winners. Enclosing water within national territory may provide temporary relief for water and energy needs, but it adversely affects the health of the whole river, including the sections that run through that same country. What is more, as the Himalayan ice pack continues to melt, and weather events become more dramatic, any 'victory' will be short-lived. Ultimately, the only way to 'win' the rivers is to maintain the climactic systems that produce them and opt for the cultural and ecological management of the entire river systems.

The push to incorporate these regions into the larger nation states by encouraging mass tourism is also affecting the region's social, cultural, hydrological, and ecological systems. The queues to climb Mount Chomolungma (Everest) earlier this year may have received global attention, but tourism is being encouraged and increasing all over the region. Most of the increase in Indian and Chinese tourism is domestic. The Himalaya are marketed as exotic, wild and nationalistic tourist destinations where visitors on both sides of the border can marvel at the cultural differences and pay homage at memorials to soldiers from the 1962 war. These two nations are also sending increasing numbers of tourists to Nepal and Bhutan, where Indian tourists could, until recently, enter without a visa.

The largest scale tourist developments have been concentrated, however, within the ethnic Tibetan regions of the PRC, where it has been prioritised as the region's primary stimulus for economic development. New infrastructure includes an extensive road network, extending its railway network, building luxury hotels and resorts, caravan parks, golf courses and even a series of small ornamental dams that supposedly improve reflections in tourists' photographs.

The Lhasa-Chengdu Railway under construction along the Yarlung Zangpo River in the Tibetan Autonomous Region.

Dams are often thought of as a 'green' alternative to fossil-fuels based energy production. However, they produce significant damage to local environments and their larger watersheds. including:

- **The concrete used to build the dams is usually dredged from the rivers that the dams will later block.**
- **The dams' reservoirs displace local communities (often small ethnic groups) and drowns habitats. This displacement leads to language and cultural loss as well as other social harms.**
- **It drowns already depleted habitats and cuts off the migration routes of animals such as the snow leopard, clouded leopard, takin, and brown bear.**
- **The dams prevent fish such as snow trout and golden mansheer from migrating and threaten many of the fish species endemic to the Tibetan Plateau.**
- **Dams create flooding and ground soaking above the dam, and desiccation and groundwater depletion below.**

Policy solutions

Amid all these dramatic transformations and the challenges of climate change, there have also been some extraordinary examples of coordinated conservation in the Himalaya. Our first policy suggestion is that these programs need to be expanded, extended, coordinated across the region, and embedded in international agreements that will ensure their continuity.

In recent years, important policy suggestions to improve environmental governance have been made. Simon Marsden, professor at Flinders University, South Australia, for example, has advocated the creation of a Himalayan Council, similar to the Arctic Council, drawing on the idea of the region as the world's "Third Pole." Peter Engelke and David Michel, scholars writing for the Atlantic Council, have similarly outlined how geopolitics prevent environmental governance in the region from developing. Indeed, as Simon Marsden noted, every other Asian region apart from the Himalaya has some form of collaborative environmental governance architecture.

Of primary concern for Marsden, Engelk and Michel is the transnational management of water resources. Although we agree this is needed, we are not convinced that the region's rivers and associated earth systems can be managed effectively through an international governance agreement limited to state actors. As our historical narrative and description of the region suggests, any lasting solution to the region's environmental issues needs to deal directly with local realities.

The first of these is to acknowledge the role that competitive state-making and consolidation of territorial claims is having on the region's environment and societies. Any international agreements that were overlayed on the Himalayas' contested governance architectures would be challenging to achieve (although examples from elsewhere suggest not impossible) and hard to sustain. We are not suggesting they should not be pursued, but that perhaps they could be negotiated within specific non-governmental frames (such as a series of treaties to protect habitats and glaciers) as opposed to wholesale international treaties.

These negotiations and any treaties that are decided upon should also include one of the most critical elements in the Arctic's Council's success: the inclusion of indigenous and scientific voices into governance decisions. This will be crucial to the development of effective environmental governance in the region.

The greater inclusion of indigenous Himalayan voices in policy-making for the region would necessitate looking beyond the state and prioritising networks of local communities and regional administrations. It would mean reversing the current trend to centralisation, incorporating more input from local groups, diffusing political power, and creating a bespoke response to environmental concerns, valley by valley. Localised governance with links to larger polities has been the most common form of governance in the region throughout its human history.

One small example of localisation would be to encourage the national and international recognition of the landmarks' local names. This recognition is important because many sites within the Himalaya are still known internationally by the colonial names. The most well-known of these names is Mt Everest, a name given by the British to the world's highest mountain under the flimsy pretence that it had no local name. The mountain is considered sacred to the Sherpas to its south and the Tibetans to its north, and although it has been given many names, its most well-known name locally is Chomolungma ("Chomo" is an honorific meaning "lady", and "langma" means "willow", "cow" or "heights"). Using this name would be a small step towards the recognition of indigenous rights in the region, and toward decolonising the Himalaya.

The importance of the Himalaya to Asia's and the world's hydrological, ecological, and climatic systems also leads us to argue for a more significant role for environmental scientists and conservationists in the region's management. The other two poles, the Antarctic and Arctic, are known in political science literature as 'science- moderated polities.' Decisions about their management are made within the context of scientific as well as political debate. Management of the Himalaya desperately needs more input from scientists, and for them to work closely with local groups.

The Himalayan environmental crisis is caused at least in part by increased state control. It follows that solutions to these problems cannot be found through state -centric programs. We are arguing, therefore, for the elevation of scientifically-advised, local-level administration in the region's governance architecture, and concordantly the elevation of the region's various ethnic communities.

In this regard, we differ from Marsden, who has advocated a governance model for the Himalaya based primarily on the Arctic Council. While this model has advantages—particularly its inclusion of local and indigenous groups, and environmental scientists—we argue that the imposition from above of a governance architecture on this region is not likely to be successful as networks of local administrative units. There would be more chance of protecting local cultures and environments if central governments were forced to negotiate with these organisations on a more even footing.

At some stage, adjustments to the region's governance will have to be made. The only question is whether they will be made before or after a massive environmental and social calamity. It is worth outlining currently implemented examples of cooperation that have had positive results on the region.

There are, for example, some treaties governing water flow in the Greater Himalayan Watershed that have established shared water usage rights. These include the Indus River Treaty, which delineates the water rights of bitter rivals India and Pakistan. There have also been a series of Confidence Building Measures (CBMs) between several of the region's local administrations and states. ICIMOD is a successful example of an intergovernmental organisation in the region.

Headquartered in Nepal, ICIMOD is a member-state based organisation that supports an associated network of universities and scientific experts. One of its key roles is to circulate environmental and scientific knowledge between member states to ensure they understand the risks and challenges facing Himalayan ecology and environment.

This knowledge sharing can help to pomote environmental best practice across borders. It even, importantly, places stress on local community engagement, and the dissemination of information at the community level. They have been particularly successful at sharing ideas for managing and coordinating earthquake recovery across international boundaries, as the region's states try to develop disaster management regimes.

What is more, there are examples across the region of state-level and sub-state actors developing environmental protocols and safeguards. For example, Sikkim has banned single-use plastic bags and is encouraging recyclable water bottles. In April 2019, the Sikkimese state government also introduced behaviour protocols for its northern, high-altitude sector. As North Sikkim is heavily militarised, the introduction of this protocol is a particularly good sign. The management of some national parks in Tibet suggests hope as their administrators have worked with local communities and attempted to follow traditional conservation customs. Ladakh's ice-stupas have proven a helpful and culturally appropriate adaptation to shrinking summer water supplies, at least temporarily.

All these initiatives emphasise the importance of local voices in governance. Those directly and immediately affected by environmental destruction are those who live near it. Many of these communities have also figured out traditional knowledge systems that have enabled them to live sustainably in these regions. We argue that they should all be strengthened, and the knowledge gained from them should be shared through a network of local authorities. ICIMOD, as an institution, should also be funded at a higher level, receive more significant support from its member states and internationally, and its membership could act as expert advisors and interlocutors for these local authorities. The units could build consensus, even across international boundaries. They could even, if allowed, develop transboundary protocols that would cover military, tourism and resource extraction (including dam building) on their lands, as well as high-altitude zones, glaciers, and along rivers.

At a minimum, in the short term, we are calling for the militaries operating in the Himalaya to abide by basic

Chinese and Pakistan border guards at Khunjerab Pass in the Karakoram Mountains

protocols that protect fragile environments such as glaciers and rivers. Military cooperation is essential for environmental protection in the mountains. The adoption of these protocols could build on the CBMs upon which India and China agreed in 1996. These CBMs provide for troop reduction, the advance notice of military manoeuvres and hotlines between military commanders have been mostly successful in staving off military conflicts along the India-China border. "Green CBMs" could build on this success and help the environment.

These protocols could then act as a basis for the development of further community and science-developed protocols covering tourism and resource extraction. Eventually, these local groups could be networked together into an organisation that resembled the Arctic Council but focused its operations at the regional, sub-state level. If the region's large states would allow for this, and a greater diversity of local government and non-government voices, it would significantly mitigate the present situation. Long-term success would require the complete demilitarisation of the Himalaya, but this will be difficult to achieve.

Although we have argued for local solutions to these issues, we would also like to reiterate how vital these mountains are to the region and the global community more generally. Given its vital role in the provision of water to most of Asia, what happens in the Himalaya affects us all. Even if the changes we have suggested (or something similar) is pursued, climate change in the Himalaya will ultimately affect everyone.

To begin with, the UN and its membersare urged to withdraw support for Large Hydropower Dam construction through the Clean Development Mechanism. These large dams are built on unstable fault lines near a shrinking ice-pack amidst various biodiversity hotspots, and the UN should not be treating them as 'clean' development. We would also urge both the Green Climate Fund, and the United Nations Environment Program to make the Himalaya a priority, and for all nations to increase their contributions to these enterprises. We all need to pay for this because climate change and conflict in the Himalaya will have flow-on effects that reach us all.

Language and diversity

Dr Gerald Roche

Globally, mountainous areas are renowned for their linguistic diversity: the rugged island of Papua New Guinea is home to over 1,000 languages, and the Caucasus Mountains of Central Asia are well known as the 'mountain of tongues.' The Himalaya are no exception to this general pattern.

The diversity results not just from the region's complex terrain, but also its rich history of migrations, and how political, religious, and other allegiances have produced social boundaries even where physical ones do not exist. Bhutan is indicative of this diversity. Smaller than Denmark and with just under one million people, it is home to some 19 distinct languages.

Given the richness of the region's linguistic diversity, it should come as no surprise that the contested, shifting borders of this region not only cut across mountains and rivers, they also cut through tongues. Languages spill across not only these national borders but also divisions along the lines of ethnicity and religion.

Furthermore, multilingualism is also high throughout the region, with monolingualism exceedingly rare. Knowing what language someone speaks only gives limited purchase on who they are, and where they are from.

Despite the seeming messiness of this situation, we can think about the languages of the Himalaya in terms of a transnational, regional linguistic hierarchy.

Although identities may shift, borders fluctuate, and people move, a rigid maldistribution of power and prestige keeps the region's languages in place relative to one another.

At the bottom of this hierarchy are small, highly localised languages, with anywhere between a handful to several thousand speakers. Such languages might be used within a single village, or a cluster of communities, a valley, or a river system.

Typically, these languages can be described as 'deprived'—they are denied the resources required to produce and reproduce a language in the 21st century: a script, a dictionary, printed materials, an education system, an active media, and so on. Beyond being materially deprived, they are also typically disesteemed, their speakers subject to social stigma, if not outright discrimination. Speakers of these local languages typically bear the greatest burden of multilingualism, as nobody outside their community learns these languages.

There are also what we might call regional languages. Larger, and with a wider distribution than local languages, these are also often spoken as a second language. Some of these languages spill across borders. For example, the Tshangla language is spoken in Bhutan (where it is the most widely spoken mother tongue), but also in China and India.

Tibetans in Rebgong, on the north east Tibetan plateau, take pictures of a religious painting while watched by police.

Two people examine a cloth printed with Tibetan text. In the village where this work is being done, locals speak a language called Minyak, one of Tibet's minority languages.

These languages have a wide range of material support, social prestige, and official status in the countries of the Himalaya. While Tshangla is a minoritised language in three countries, Nepali is the dominant language of Nepal (once, but no longer, the official tongue). Somewhere in between these two sits Tibetan, a deterritorialised regional language that has significant historical prestige and continuing influence as a sacred language in the region.

Then there are the super-dominant national languages of the region's mega-states, China and India. In China, the national language is Putonghua (standard Mandarin), a language which, much like Bahasa Indonesia, was an artificial creation, with no native speaker population.

Putonghua is currently aggressively promoted within the PRC, with devastating effects for numerous smaller languages across the country, including in its Himalayan frontiers. In India, meanwhile, Hindi is being promoted with increasing force by Modi's government, leading to rising accusations of 'Hindi Imperialism' and a range of pushback initiatives from street protests to local policy measures.

English, ironically enough, is the only linguistic thread that weaves this complex patchwork together. English is an important additional language and an integral part of schooling in both India and China. In Nepal, it is considered the language of social (and physical) mobility, while Bhutan, with its compulsory English-medium education, has been described by the linguist George van Driem as Asia's most English-proficient country. When it comes to language, then, the glue that binds this region together is both a legacy of the region's imperial past and a signature of contemporary linguistic imperialism.

Relations between the region's languages are to a large extent created by the policies of the region's states, though factors such as historical inertia and demographics also play a role. Language policy in the region shows significant divergences and surprising parallels, as can be seen through a comparison between India and China. Given the enormous and obvious differences between the political systems of the two countries, we might start with the differences in their languages policy.

The most obvious distinction is that India is what we might call a 'splitter', while China is a 'lumper', as can be seen through an examination of the Tibetan situation. In India, what are recognised as independent languages, such as Ladakhi and Drenjongke (spoken in Sikkim), would in China be considered dialects of a single Tibetan language (as would the Bhutanese national language, Dzongkha). In part, this capacity for greater recognition in the Indian case is because its political system is much more dynamic and responsive than China's, as seen, for example, in the continually expanding register of officially recognised ('scheduled') languages in the Indian constitution.

Despite these differences, there are also important parallels between language policy in the two Himalayan super-states. The most significant overlap is seen in their refusal to formally acknowledge, and thus provide support for, the smaller languages, by demoting them to dialects.

In India, this manifests as an arbitrary statistical threshold which sees any language with under 10,000 speakers compulsorily labelled as a dialect. In China, meanwhile, there are no formal criteria for language recognition, nor are languages and their users counted in government statistics. The erasure of languages as dialects is therefore primarily achieved through malicious vagueness. In both cases, the demotion of languages to the status of dialects is the same: material deprivation and status subordination.

Given this policy regime, with its distinctions and parallels, and the region's transnational language hierarchy, the languages of the Himalaya, and the communities that use them, are impacted very differently by the transformations currently being experienced in the region. Regional conflict and increasing economic integration are likely to intensify both demand and need for English, while simultaneously driving promotion of Hindi and Putonghua as super-dominant national languages.

Under intensifying pressure from English, Hindi, and Putonghua, regional languages, especially those that are already in precarious positions in terms of their host states, are likely to suffer. But at the forefront of the rising tensions of the region will undoubtedly be the many small, local languages of the region.

Speakers of these languages will be the first to lose and the last to benefit from the mounting tensions, increasing militarisation, and degrading the environment of the Himalaya. Efforts to track and diminish the negative impacts of rising tensions in the region would do well to focus on these super-marginalised communities as the canaries in the coal mine of regional transformation.

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