MCCS EXPERT GROUP

CLIMATE SECURITY AND THE STRATEGIC ENERGY PATHWAY IN SOUTH ASIA

PART OF THE "WORLD CLIMATE AND SECURITY REPORT 2020" BRIEFER SERIES

A Product of the Expert Group of the
INTERNATIONAL MILITARY COUNCIL ON CLIMATE AND SECURITY

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THE CENTER FOR CLIMATE AND SECURITY

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February 2021

Cover Photo:
Rescue operation of the crew of the MV Coastal Pride by the Indian Coast Guard and Navy on June 24, 2015. The successful operation rescued all 14 crew from a position 15 km off the coast of Umargam, north of Mumbai, where they had been stranded due to strong winds, rough seas and poor visibility.

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The International Military Council on Climate and Security (IMCCS) is a group of senior military leaders, security experts, and security institutions across the globe dedicated to anticipating, analyzing, and addressing the security risks of a changing climate. The IMCCS is co-led by:

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The IMCCS Expert Group consists of IMCCS leaders committed to driving analysis, policy and communications on climate and security, including through the development, publication and endorsement of the World Climate and Security Report and related publications. The IMCCS Expert Group currently consists of representatives from four institutions:

- The Center for Climate and Security (CCS), an institute of the Council on Strategic Risks (CSR)
- The Planetary Security Initiative at the Netherlands Institute of International Relations (Clingendael)
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EXECUTIVE SUMMARY AND KEY RECOMMENDATIONS

South Asia's geography makes it particularly vulnerable to climate change. Less appreciated is the likely impact of climatic change on security and stability in the region, both within and between states. Climate impacts can amplify existing underlying socio-economic tensions, resource scarcity, instability, national rivalries, and basic health and governance challenges. At the same time, they can compromise the ability of first responders, which are often military, to effectively respond.

From an intra-state perspective, security can be compromised when climate impacts vulnerable populations, triggering or magnifying unrest, inter-ethnic violence, internal rebellion or mass migration. How the local and national governments respond will determine the duration and extent of the security challenge. Inter-state relations may also be vulnerable to climate change, particularly when it coincides with existing inter-state rivalries. The China-India and India-Pakistan rivalries are the most dangerous, as all three are nuclear-armed states. Actual or perceived manipulation of water by China could be a catalyst or magnifier for conflict with India. Similarly, volatility in the river water flows from India to Pakistan could spark inter-state tensions and increased violence in the Kashmir region. Halting this dangerous cycle will require concerted action along multiple fronts.

Policy makers in security, foreign policy and energy policy arenas should systematically assess the impact of current and projected climate change on their respective domains. They should then take urgent, coordinated action to decrease the vulnerability of populations to climate impacts; reduce the incidence of climate-magnified security threats through better inter-state dialog and water institutionalization; and plan sustainable energy pathways at sub-national, national and regional levels.

Key recommendations:

- ***Security actors*** **in the region should fully integrate climate change projections and their cascading effects into security projections, planning, equipment acquisition and training,** including by:
  - Ensuring that military facilities and procurement managers consult the latest climate science when acquiring or updating installations and equipment.
  - Requiring planners to account for the potentially magnifying effect of climate on conflict when performing threat assessments, planning, training and joint military exercises, including through experience-sharing with regional actors and allies and from expert groups such as the International Military Council on Climate and Security.[1]

• ***Foreign policy actors*** **in the region should actively seek to enshrine common environmental and climate security goals into regional agreements and practices,** including by:

  • Working toward a comprehensive treaty covering the Brahmaputra River Basin among China, India, Nepal, and Bangladesh, that stresses joint, climate-sensitive and sustainable water management. A practical short-term step forward would be the deepening of technical exchanges between these states.

  • Strengthening the currently weak South Asian Association of Regional Cooperation (SAARC) to help manage climate security risks in the Indus River Basin, with its disaster management mechanism as a key axis of deeper collaboration.

• ***Energy policy actors*** **in the region should incorporate the systemic costs of human security, internal security and external security into the calculus of energy policy**, including by:

  • Speedily replacing fossil fuels with low- or no-carbon sources of energy, especially now that such alternative sources are becoming economically competitive, in particular in electricity generation.

  • Adhering to the World Economic Forum's proposed, systemic coal draw-down via a "coal retirement mechanism" and a "sustainable energy transition mechanism."[2]

  • Limiting the ramp-up and import of natural gas to the extent feasible as renewables and electrification become more attractive.

INTRODUCTION

Climate change is projected to have significant direct effects on South Asia, particularly as sea level rise threatens coastal populations and infrastructure and scorching heat makes being outside in parts of the region increasingly unbearable for portions of the year. What is less appreciated is the role of climate change as a *threat multiplier*.[3] Its impact will amplify existing internal tensions and resource strains in crowded urban areas; offer violent extremist groups opportunities to advance their cause; contribute to forced displacement of people and international migration; and compromise military readiness. Even more consequential are the potential impacts on existing international stress points, particularly the contested India-China and India-Pakistan border regions. Given that all three are nuclear states, anticipating and managing climate impacts on conflicts before they spiral out of control is absolutely essential.

One of the prominent lessons of a pandemic-stricken 2020 is that widespread, systemic challenges are best addressed by broadly-coordinated, systemic responses. Nowhere is this more true than in South Asia,[4] whose population of almost 2 billion[5] faced major structural challenges including endemic poverty, poor governance, water stress, and energy deficits even before COVID-19 hit the regional economy with an expected contraction of 7.7%[6] in 2020. South Asia is also still heavily dependent on fossil fuels for energy. The resulting emissions add to the atmospheric greenhouse gases which are the dominant cause of climate change, which in turn magnifies existing physical and socio-economic stressors that can induce resource scarcity, health impacts, and mass migration, amplifying existing security challenges and creating new ones.

This briefer analyzes the nexus between climate change and South Asian security. It examines potential climate security flashpoints relevant to regional and global policymakers. It then concludes with recommendations for addressing systemic climate security challenges in the domains of energy policy, foreign policy and security planning.

CLIMATE HAZARDS AND VULNERABILITY

Climate science shows clear implications for South Asia. The region is highly vulnerable to multiple climate *hazards*, i.e. heatwaves, extreme rainfall, floods, droughts, and sea level rise. Historic data offers a sense of the geographic distribution of growing climate hazards (Figure 1). Whenever these hazards occur in zones of large populations and significant economic activity, they lead to serious climate *exposure*. Populations which are poorly equipped to cope or adapt with the threats may experience a high degree of climate *vulnerability*.[7]

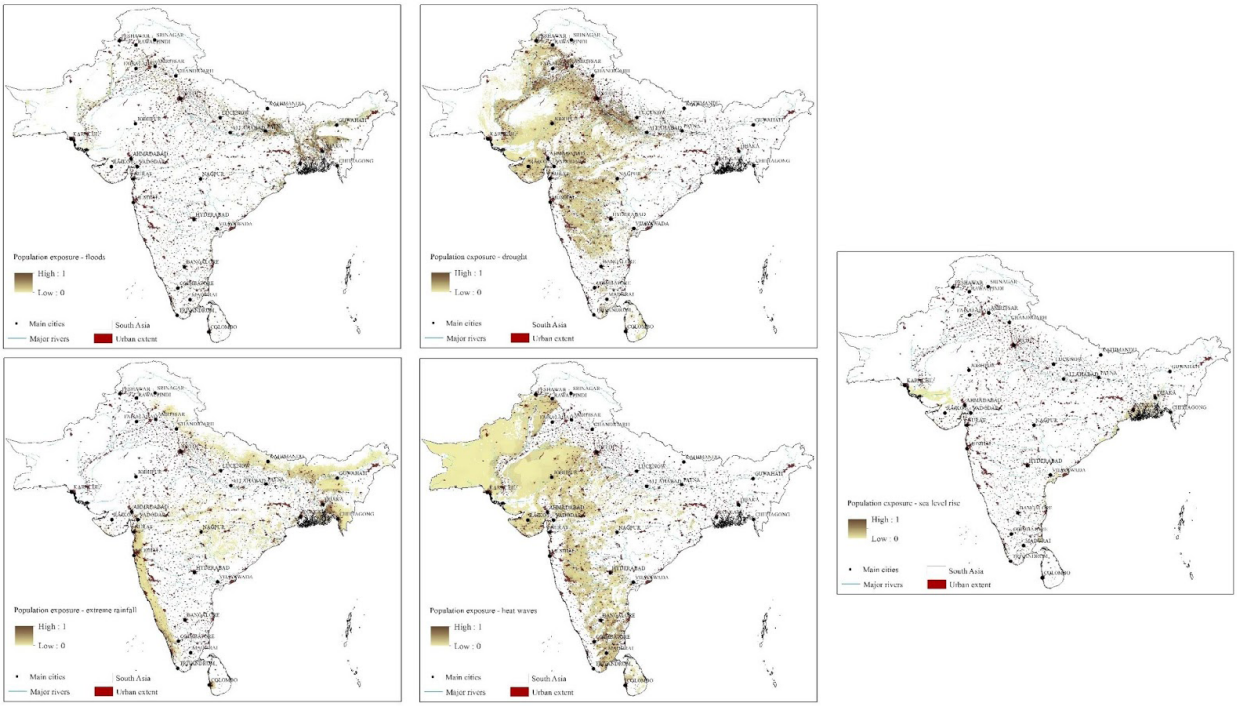

Figure 1: Historic data indicates risks for heatwaves and drought is highest in the western half of South Asia, while intense rainfall is concentrated along its west coast and northeast. Sea level rise threatens several major cities.

Source: International Water Management Institute 2017.

Combining hazards, exposure, and ability to cope yields the extent of climate vulnerability. Vulnerability assessments indicate that a major portion of South Asia, especially its peninsular region, both its coasts, the northeast, and extreme west, have the highest climate vulnerability (Figure 2). In terms of South Asian countries, Bangladesh is most vulnerable, but India, Pakistan and Nepal are only somewhat better off. Bhutan, followed by Sri Lanka, are better situated but still at risk. The island nation of Maldives (not shown in Figure 2) is existentially threatened by sea level rise. Such vulnerabilities have implications for health, livelihoods, and migration patterns in South Asia, which in turn affect sub-national, national and regional security.

Scientific projections show with increasing confidence that climate change will push temperatures in parts of South Asia beyond human tolerance levels; change the disposition and flow of the Asian "water towers" anchored on the Tibetan Plateau;[8] inundate low-lying coastal areas, and disrupt regional agriculture and ecosystems. Climate-induced heat becomes a chronic health risk as temperatures climb to levels not supportable by human beings. With Asia's summers projected to be 6°C (43°F) hotter by 2100, and new research showing wet-bulb temperatures as low as 26°C (79°F) can lead to impairment or even death, the danger is especially acute for those with pre-existing conditions, the elderly, and laborers performing high-exertion activity outside.

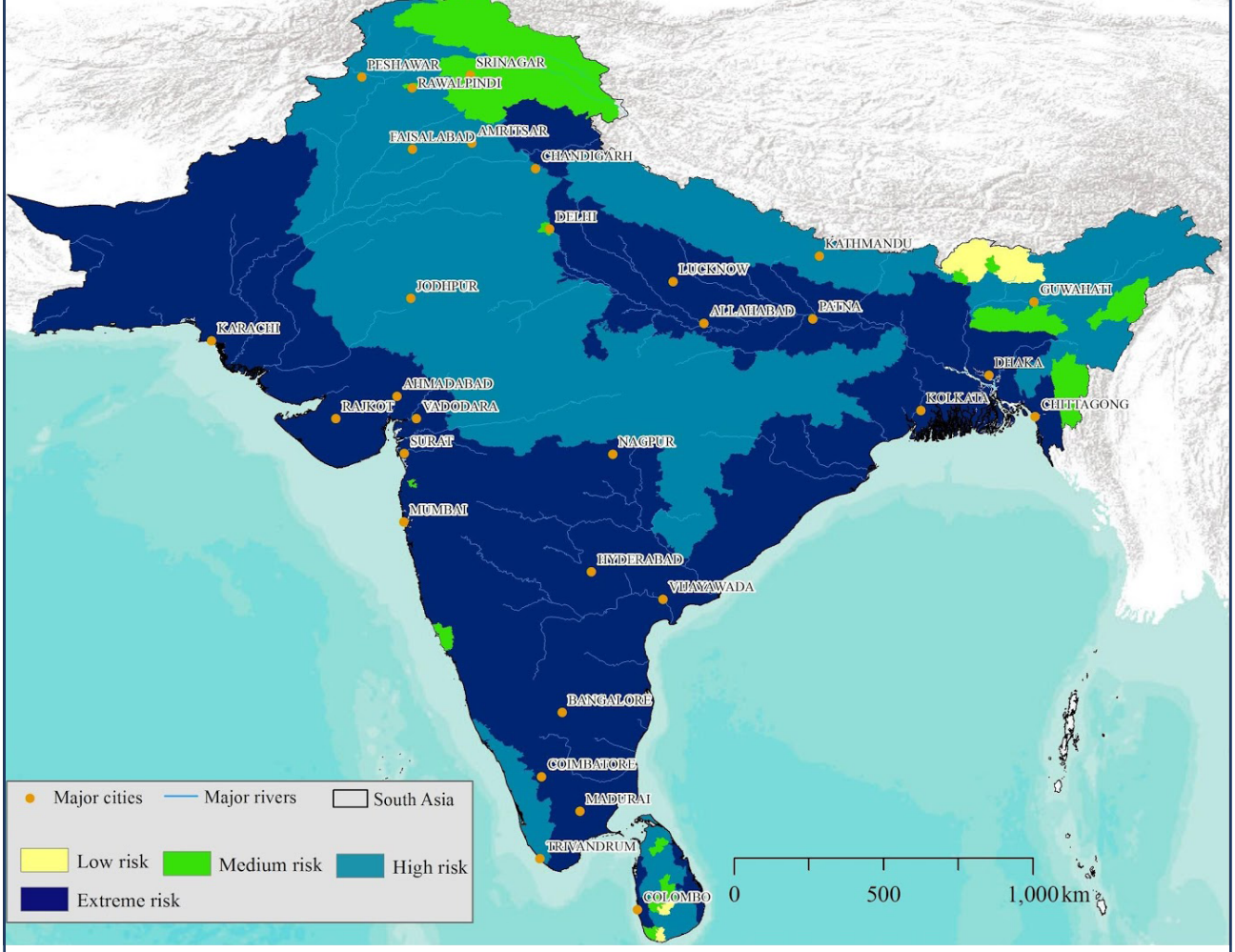

Figure 2: Composite climate vulnerability mapped across South Asia.

Source: International Water Management Institute 2017.

Climate change can cause more intense rainfall and make hurricanes and storms potentially more potent. The consequent flooding can take an enormous human and economic toll. Cyclones in the Indian Ocean are expected to get more intense, especially those in the Arabian Sea. Extreme rainfall activity is concentrated along much of South Asia's western coastline and its northeastern region, whereas flooding risk is typically closer to its major rivers in the subcontinent's northern regions.[9] Sea level rise occurs both due to the expansion of water in the oceans with temperature rise and melting of polar ice, combined with local factors such as tides and coastal terrain. The cities of Kolkata, Mumbai, Chennai, and Karachi are the most threatened by sea level rise.[10]

These effects are already manifesting. The Internal Displacement Monitoring Centre reported 18.8 million internal refugees from natural disasters in 2017[11] and 24.9 million in 2019;[12] The World Bank expects that number to be in excess of 143 million by 2050.[13] Noted health journal *The Lancet* reported that India lost over 118 billion hours of work in 2019 due to extreme heat.[14] A recent McKinsey report projects that by 2050, loss of outdoor work hours will rise to 30% of daylight hours annually, while water from glacial melt in the Hindu-Kush-Himalayan region will fall 20%-40%.[15] Depending on socioeconomic conditions, each of these impacts may have adverse implications for security.

CLIMATE SECURITY IMPACTS

Climate change threatens security interests in South Asia in multiple dimensions, in particular through shared river basins. The Ganges, Brahmaputra and Indus Rivers are of particular concern, given increasing Chinese, Indian and Pakistani demand for water. Over half of the latter two rivers' basins experience both high water stress and high exposure to climate change. Both rivers are expected to have a reduction in flows by mid-century, with enormous impact. The Ganges is home to an estimated 614 million people and produces about a third of Indian GDP, while 88% of Pakistan's population and 92% of its GDP is linked to the Indus region.[16] Historical drought trends indicate that areas most threatened lie in the western and peninsular parts of South Asia, though climate change may alter future drought patterns and place new stresses on other regions.[17]

This analysis focuses on two categories of climate-linked security impacts in South Asia: internal and external security.

INTERNAL SECURITY

Climate change compromises a nation's internal security when enhanced climate vulnerability among the population triggers unrest, inter-ethnic violence, internal rebellion, or internal displacement of peoples and migration. The catalyst could be a short-term natural disaster such as a flood or cyclone which impairs an already fragile government's ability to provide essential services, or a longer-term vulnerability such as extended drought. How the government handles the resulting resource scarcity or competition -- whether it is perceived to be favoring a particular group, or if groups take advantage of disaster-induced resource scarcity to project violent or separatist aims -- will determine the extent and longevity of the security challenge.

In some cases, disadvantaged populations turn to self-inflicted violence. An example is the suicide rate amongst Indian farmers, which official reports put at about 16,000 a year[18] but is likely much higher. At first glance the cause seems economic: subsistence farmers struggling with the high costs of agricultural inputs lack viable options to feed their families. Yet the economic stress seems to be climate-induced. Most of the suicides occur in drought-ridden provinces, which are projected to become even drier as climate change progresses. Parts of peninsular and northwestern India are at greatest risk in terms of drought (Figure 3).

Floods can also spark discontent. Parts of eastern and northeastern India have high risks of flooding.[19] Coastal Bangladesh and coastal megacities such as Karachi and Mumbai are also threatened by flooding, partly induced by sea level rise. The massive 2010 floods in northern Pakistan were partially attributable to climate change.[20]

SEPARATIST AND VIOLENT EXTREMIST GROUPS

Natural disasters and other climate change effects may also provide an opportunity for separatist and violent extremist groups to gain traction as governments struggle to respond. The 2010 floods in Pakistan, which affected 20 million people and killed almost 2000, are one example. The floods gave the Pakistani Taliban respite from fighting the Pakistani Army. The group took advantage of the pause in hostilities to offer aid to the local population,[21] while concurrently demanding the government reject Western assistance.[22] The Pakistani Taliban then threatened foreign aid workers if the government didn't comply, and finally acted on these threats by murdering foreign aid workers.[23]

Similar dynamics are at play in some fraught sub-national regions of India. The resource-rich states of Chhattisgarh and Jharkhand are home to a number of indigenous groups, including a Maoist militant group intent on replacing the Indian government with a peasant-oriented communist regime. While investment in infrastructure and jobs has succeeded in suppressing violence in recent years, the advent of climate-induced resource scarcity could fuel a new round of violence. Similarly, separatist groups in northeast India have been kept at bay by a combination of political outreach and military presence.[24] These sensitive internal security situations could be upset by severe weather which impacts the ability of sub-groups to provide for their economic livelihoods.

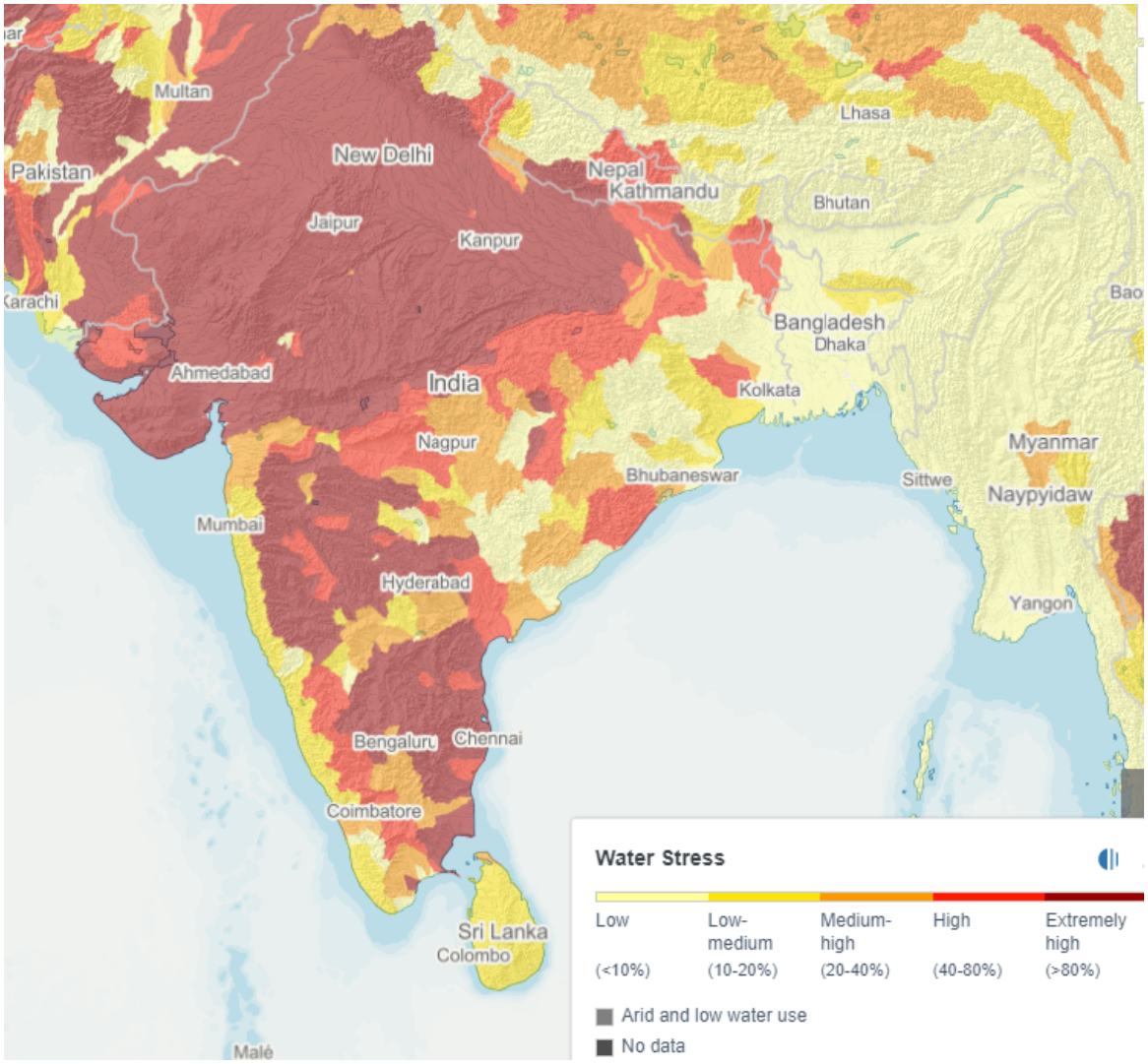

Figure 3: Water-stressed regions in South Asia.

Source: World Resources Institute, *Aqueduct Water Risk Atlas, 2020.*

INTERNAL DISPLACEMENT AND MIGRATION

Climate-induced internal displacement and migration can stress densely-packed urban areas beyond social breaking points. For example, internal migration in India reached 9 million between 2011-2016,[25] with migrants moving largely from the poorer northern states to the more economically vibrant southern states. In South Asia overall, about 63 million people are projected to migrate due to climate change by 2050, or 34 million in the more optimistic scenario of keeping global warming within 2 degrees C as targeted in the Paris climate agreement.[26] As boundaries of India's federal states historically coincide with specific linguistic, religious and cultural attributes, the influx of migrants from other states are sometimes not wholly welcome. The ensuing competition for jobs and space, as well as fear-mongering by ethnonationalist political forces, can both exacerbate ethnic tensions, and challenge state institutions -- a growing concern with the advent of stronger climate change impacts in the future.

In Bangladesh, 134 million people, or more than 82% of the population, live in areas projected to be moderately or severely affected by climate impacts by 2050 in a "carbon-intensive" scenario.[27] In 2019, the latest year for which figures are available, over 4 million Bangladeshis were displaced, largely due to cyclones.[28] This does not include the plight of the Rohingya refugees in Bangladesh, who were removed from crowded camps in Dhaka to a low-lying island in the Bay of Bengal in late 2020, where they are likely to face new vulnerabilities, including from climate change.[29]

MILITARY READINESS

Climate change threatens regional militaries in two primary ways. First, military installations are essentially small cities, with the same vulnerabilities as their civilian counterparts.[30] People, infrastructure, and assets need to be protected from the impacts of extreme weather. Second, military missions are evolving in light of climate-induced natural disasters. As 'first responders of last resort,'[31] Indo-Pacific militaries have been undertaking urgent Humanitarian Assistance/Disaster Response (HA/DR) operations for years, both domestically and abroad. To meet escalating demand, India created the National Disaster Response Force, which comprises 12 battalions and resides under the Ministry of Home Affairs.[32] Sri Lanka formed a similarly dedicated force,[33] and in late 2019 consolidated all disaster preparation, response and reconstruction under the Defense Ministry.[34] While these developments show increased capacity, deployments - including those to help regional neighbours - are also on the rise.[35] [36] Quick, effective response can both save lives on the ground and build trust with the recipient state's populace. That said, suspicions of ulterior motives - such as politicizing disaster response missions or using joint humanitarian exercises to glean military intelligence - have been raised with regard to China's HA/DR deployments in the region.[37]

EXTERNAL SECURITY

Climate change is also impacting South Asian countries' foreign security relations, particularly when it occurs in conjunction with existing, serious interstate rivalries. Of these, the China-India and India-Pakistan rivalries are the most critical. All three are major powers with nuclear weapons. Although China lies geographically outside South Asia, its adversarial relationship with India, marked by newly militarized border tensions, puts the rivalry at the heart of South Asia's security. India and Pakistan have fought four wars in recent history, and some of the most recent developments, such as a serious military clash in early 2019, have taken relations to a new low.

CHINA-INDIA RIVALRY

China and India have been security rivals since a border war in 1962. Two core causes of the rivalry are a nearly 3,500 km-long fiercely contested border and traditional Chinese support for India's adversary Pakistan. Though China-India relations were tense for years after the 1962 war, they were largely normalized in 1988 in the wake of a major military face-off.[38] For more than two decades after this rapprochement, China and India separated their disputes from economic engagement and cooperation in international fora.

Relations began to deteriorate around 2010 with growing military face-offs, but turned much worse in the spring of 2020, when Chinese troops allegedly seized nearly 1000 sq. km. of Indian-held and buffer territory in the western portion of the India-China border area, known as the Line of Actual Control (LAC).[39] A military clash on June 15, 2020 led to the deaths of 20 Indian and an unknown number of Chinese troops.[40] The deaths were the first on the India-China border in 45 years, and thus marked a major security escalation. As of January 2021, both sides have deployed tens of thousands of troops with artillery and tanks at or close to the face-off points. Further military clashes and casualties are plausible.

The root causes of the India-China rivalry are geopolitical, and climate change will likely impact the geopolitical relationship in multiple ways, perhaps the most important of which is through shared rivers (Figure 4).[41] Three major rivers -- Indus, Sutlej, and Brahmaputra -- originate in Chinese-held Tibet, but flow through India. Whereas an international accord, the Indus Waters Treaty (IWT), governs water sharing between India and Pakistan, no such treaty exists between India and China.

Figure 4: Major rivers originating in Tibet.
Source: Council on Foreign Relations, 2016.[42]

The Brahmaputra (known as Yarlung Tsangpo in Tibet) is the largest and most important of these rivers. It carries more water than Europe's 20 largest rivers *combined*, and is the focus of recent Chinese dam-building projects. The 510 MW Zangmu dam was inaugurated in 2015, and the 360 MW Jiacha dam is almost ready to be commissioned.[43] Two more dams -- the Dagu and the Jiexu -- are also planned. Rated at 640 MW, the Dagu will be the biggest of the four.[44] All the dams are located in eastern Tibet, not far from the Indian state of Arunachal Pradesh, which China claims as its own territory, and calls Southern Tibet. The Lolha dam on the Xiabuqu river, a tributary of the Brahmaputra, has also been completed.[45] A total of 28 dams have been proposed on Tibet's rivers, though not all of them are likely to be built.[46] Recent new dam announcements by China and India have upped the ante in this intensifying hydro-rivalry.[47] An additional five dams in the Indus River Basin in Pakistani-held Kashmir, to be financed and built by China, also are a sore spot for New Delhi.[48]

China and India have a basic technical data-sharing agreement in which China (as the upstream actor) shares Brahmaputra hydrological data in the May-to-October monsoon period from three hydrological stations in Tibet.[49] The agreement, however, is not a binding treaty. During the Doklam crisis of 2017, China suspended data-sharing, then resumed it the following year. Current military tensions on the border have heightened the risk of another suspension.

The combination of bitter distrust between India and China and intensifying climate change effects will almost certainly increase tensions in the region and heighten the risk of conflict between the two countries. Both Chinese dams and climate change will likely adversely impact India's portion of the river basin, though given the lack of trust in the relationship, New Delhi is likely to perceive bad-faith Chinese actions regardless of the underlying source of the problem. For example, India suspects that China could block water flow of the Brahmaputra and its tributaries, though a significant portion of the Brahmaputra's water originates in monsoon rainfall on the Indian side.[50] Also, climate change is melting glaciers on the Tibetan plateau and increasing the intensity of monsoon rainfall, likely leading to increased flash floods in the Indian states of Assam and Arunachal Pradesh.

China, in turn, is concerned about India's major dam proposals in Arunachal Pradesh, including the 600 MW Kameng, the 2000 MW Subansiri and the 2880 MW Dibang projects.[51] China sees these dams as entrenching India's hold over the region, which Beijing claims as its own territory.

The geology of the Himalayas are another concerning factor. The young mountain range is prone to avalanches and landslides. The Himalayas-Tibet region is also a seismic zone. Thus there is a risk of an adverse natural event causing major damage to Tibet's dams, which could lead to floods downstream in India. High silt loads are a feature of Tibet's rivers, and are essential to maintain fertility of the agricultural soil downstream. China's dam-building will reduce these flows, thereby likely causing a deterioration in food security and human habitats in India and Bangladesh.

China's goal of delivering water to its population centers is another concern. As northern China suffers from projected and major water shortages due to growing consumption and climate change, major water diversion projects have begun in the country's south.[52] Currently, the Yangtze is the focus of such projects. However, the Brahmaputra could well be another major source in the future, particularly given the low demand in sparsely populated Tibet, though water available to divert in most of the rivers Tibetan portion is only a fraction of the flow in India.[53] China's new dam announcement (see above) further increases possibilities for water diversion.

INDIA-PAKISTAN RIVALRY

Contestations over the territory of Kashmir and allegations of terrorism both roil the India-Pakistan nuclear rivalry, one of the most risk-prone in the world. India and Pakistan view Kashmir differently. For Pakistan, achieving control over all of Kashmir has been a key strategic goal since independence. For India, Kashmir is an integral part of its self-conception as a nation.

Climate change contributes to and magnifies this deadly rivalry. Its impact is mainly manifested through the shared Indus River Basin (IRB), which consists of six rivers that flow through both countries.[54] Both India and Pakistan are highly water-stressed countries, and changes to historic water flows affect crops and livelihoods. The Indus Water Treaty (IWT) is a World Bank-brokered international treaty governing the sharing of the basin's waters, and is the only formal mechanism for inter-state data-sharing and management of critical water resources in the basin.

The IWT partitions the basin's rivers, allotting the three eastern rivers Sutlej, Beas, and Ravi for India and the three western rivers Chenab, Jhelum, and Indus for Pakistan. In the IRB, this impacts both floods and droughts. India, as the upstream actor, has more geographic control over the basin than Pakistan, though the IWT constrains New Delhi in important ways, including from building storage beyond a modest limit.

Climate change acts as a magnifier of the India-Pakistan conflict principally through increased variability of water flows due to changing patterns of precipitation and glacier melt. Increases in both rainfall and concentration of precipitation events over the western Himalayas have been shown to be caused by climate change.[55] Environmental degradation and climate change are also incentivizing dam designs that open the door to bad-faith actions and misunderstandings between the two countries.[56] Pakistan worries that India will manipulate dam storage levels to amplify downstream floods and cause major damage to the Pakistani population and economy. Pakistan believes that the advent of planned dams upstream will increase the likelihood of such a predicament. India worries that Pakistan will use climate-enhanced floods to falsely accuse India of manipulating upstream flows, and aid Islamist militants' attacks on Indian dam projects.[57] India has long alleged Pakistani backing for such activity in Kashmir and elsewhere.

As the downstream actor, Pakistan is in a structurally weaker position. It has challenged several Indian projects as exceeding storage capacity limits, even as India argues its dams are not in violation of the treaty, and it draws less water than legally entitled. Two key disputes (over the Baglihar and Kishenganga dams) have been referred to and decided by the adjudication mechanism in the IWT, with mixed results for both sides.[58] As noted above, climate change will increase stress on the river basin in the future, likely leading to more such water-sharing disputes.

ENERGY DECARBONIZATION PATHWAYS

Eliminating sources of GHG emissions, i.e. decarbonization, is key to tackling the scale and scope of climate change, and thereby mitigating associated security risks. South Asia is not a major source of historic GHG emissions, but contributes substantially to the current regional carbon footprint chiefly through burning coal for electricity and oil for transport (Figure 5).

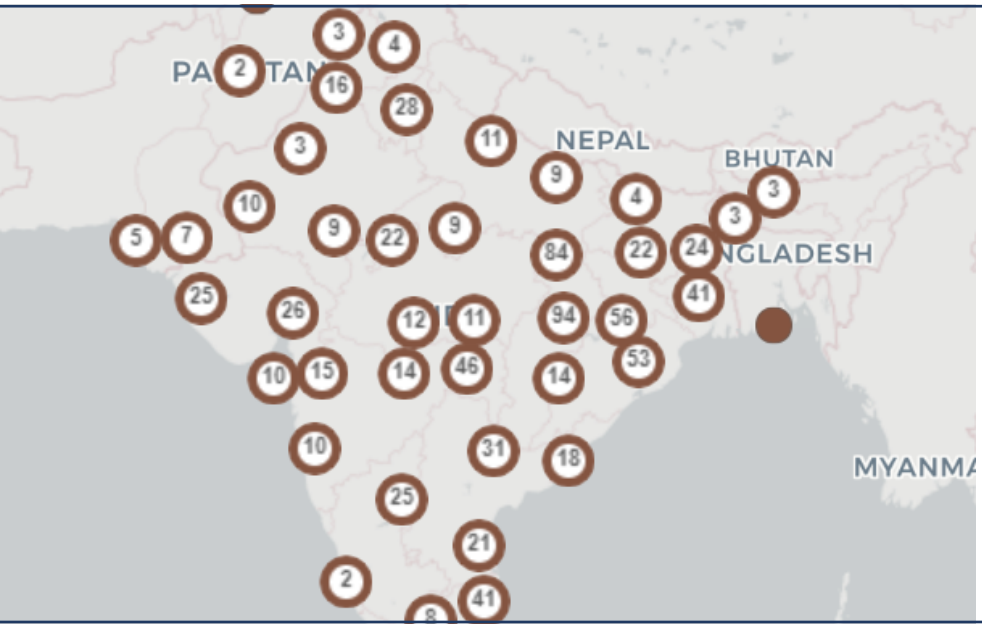

Figure 5: South Asia's major coal plants. Figures represent the number of plants close to the indicated site. Most coal plants in the region are located in the east and central parts of India.

Source: Global Coal Plant Tracker, 2020.[59]

Rising temperatures and pre-pandemic economic growth have been driving an increase in energy demand across the region. Thus new power capacity additions are on the rise. In Pakistan and Bangladesh, most of these are coal and natural gas-fueled.[60] Given the economic impacts of the pandemic, however, these planned additions risk overcapacity and may drain critical funds that could instead be directed at 'green recovery.'[61] An appropriate mitigation strategy for the region would curb new fossil power projects and instead focus on expanding renewable energy investments. Pakistan has taken limited steps in this direction, setting a goal to achieve 30% of its electric power from renewable sources by 2030, up from 4% today.[62] Meanwhile, Bangladesh announced plans to move from 3% to 10% renewables from 2019-2020, an aspiration that is still in the planning phase.[63] Because of its population density, severe land constraints mean that distributed (rather than centralized) solar will be the best option for decarbonization in Bangladesh.

India, by far the largest South Asian economy, added significant coal capacity in the last decade. Since 2014 it has also greatly expanded its renewables (especially solar) portfolio, after announcing an ambitious 175 GW target for renewables by 2022, partly due to pressure from the international community.[64] The result has been a major fall-off in new coal additions since 2016,[65] though 2019 saw somewhat of a comeback

for this energy source (Figure 6). Even so, more than 70% of India's electricity, or about 200 GW of power capacity, is still generated from coal. Decarbonizing the country's electricity sector will require shuttering many older, inefficient coal plants and replacing them with non-fossil fuel sources. It will also mean replacing coal with renewables rather than natural gas, instituting a push to electrify cooking, and embracing solar water heaters at scale. Although natural gas is a cleaner fuel than coal, new additions will result in long-term fossil fuel lock-in and is not desirable.

Looking forward, the good news for South Asia is that renewables are now cost-competitive with coal in most cases. Substantial financing will still be required, however, for capacity replacement and compensating losing workers and businesses in the fossil fuel industry across the region. As the cost of capital is very high in South Asia, large volumes of international, low-interest finance are critical to push the energy transition forward in the region.

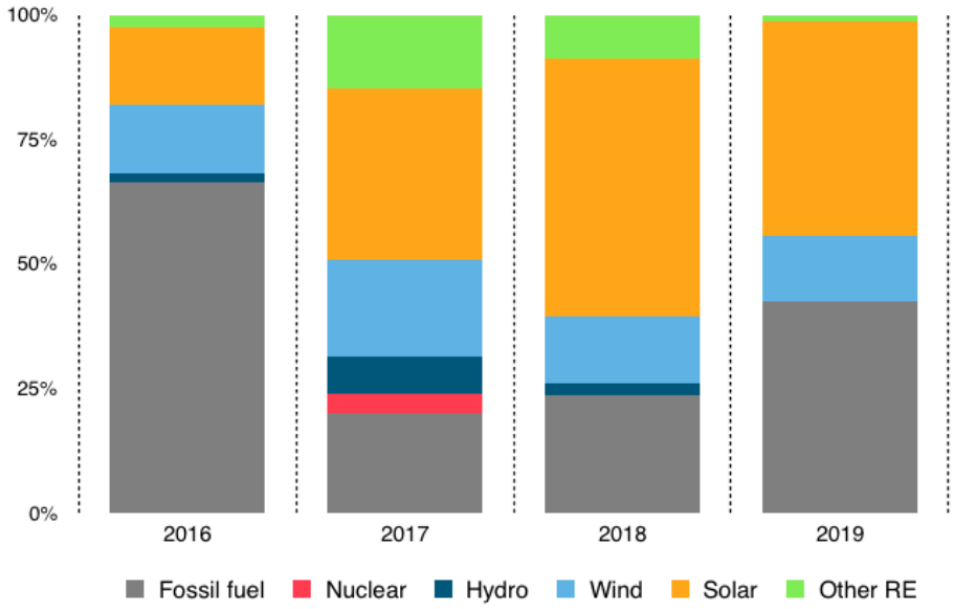

Figure 6: New power capacity additions in India since 2016, broken down by percentage of fuel sources. The fraction of fossil (predominantly coal) additions reduced as renewables surged, but 2019 saw a reversal.

Source: Cleantechnica, 2020.[66]

Decarbonization in South Asia also implies adopting more mass transit, better urban planning and large-scale ramp up of zero-emission vehicles (ZEV). A move to electric vehicles would also improve energy security, as South Asian nations spend a large fraction of their foreign exchange on oil imports, mainly from the unstable Middle East. ZEV strategies in South Asia are still at the nascent stage. India has announced a target of 30% EV penetration by 2030 under its FAME II scheme, but it is unclear if this is practicable.[67] India currently has no indigenous battery manufacturing capacity, and is wary of relying on Chinese imports.

RECOMMENDATIONS

Returning to the observation that broad, systemic challenges are most appropriately addressed by widely-coordinated, systemic responses, action should be taken in three distinct but interrelated areas of governance: national security policy, national energy policy, and international regimes, to reinforce agreed regional climate security objectives.

Security actors in the region should fully integrate climate change projections and their cascading effects into security projections, planning, equipment acquisition and training. This effort should include, but go beyond the boundaries of, humanitarian assistance and disaster response. As a first order of business, militaries should take care of themselves. Facilities and procurement managers should consult the latest climate science when acquiring or updating installations and equipment. Assets should be stress-tested when past planning assumptions become outdated. Second, planners should account for the potentially amplifying effect of climate change on conflict when performing threat assessments, planning, training and joint military exercises at the bilateral or regional level. Much can be gained from proactive experience-sharing, both amongst regional actors and allies and from expert groups such as the International Military Council on Climate and Security,[68] fast-forwarding practical incorporation of climate impacts into defense policy and planning. Finally, recognizing that what gets measured gets managed, militaries should routinely measure and account for resources (time, manpower, funding) spent on both climate-related natural disasters and on climate-enabled security situations. Such data, combined with experience and international sharing, will help inform the process of 'climate-proofing' security institutions for the future.

Foreign policy actors in the region should actively seek to enshrine common environmental and climate security goals into regional agreements and practices. Interstate disputes that climate change potentially exacerbates, such as over transboundary rivers, require new approaches and potentially new regional institutions or agreements. For example, the growing risk of instability and conflict due to disputes over the Brahmaputra River basin requires attention. Ideally, relevant parties would initiate a process for a comprehensive treaty covering the Brahmaputra among China, India, Nepal, and Bangladesh, that stresses joint and sustainable water management. The realistic prospects of such a new arrangement, however, are remote under the current fraught geopolitical situation in the region. More practically, the World Bank, in its dual roles as guarantor for the IWT and source of billions of dollars in development funding for the region, might consider (after consultation with all parties) setting up more technical exchanges among relevant countries in the region to facilitate modest gains on data exchange, as well as the longer-term of goal of helping each better appreciate others' positions.

Strengthening the currently weak South Asian Association of Regional Cooperation (SAARC) would also help manage climate security risks, with its disaster management mechanism as a key axis of deeper collaboration. Normalising such collaboration, and creating protocols for joint rapid response, could contribute to regional confidence- and trust-building. That said, it is imperative that military forces be mindful of the expected roles of military and civilian humanitarian organizations in disaster response. Care

should be taken to avoid provoking existing conflict patterns or being perceived as favoring some parties in local conflicts over others.

Energy policy actors in the region should incorporate the systemic costs of human security, internal security and external security into the calculus of energy policy. These externalities are currently either wholly outside the ambit of energy policy discussions, or mentioned only as an afterthought. While climate change is a global phenomenon with global ramifications, state-level policy decisions drive outcomes for the collective whole. And those outcomes - or impacts - hit hard in South Asia. Thus South Asian nations have incentive to lead by example, establishing pragmatic policies to decarbonize, even as the international community has an obligation to help finance such a transition and offer technical assistance. Recent research shows that coal must be phased out globally by 2040 to meet the 1.5^{0}C goal set in the Paris Agreement.[69] Sufficient non-fossil fuel energy potential exists to serve local needs[70] with proper investment and policy support from the international community. The World Economic Forum has proposed a systemic coal draw-down via a "coal retirement mechanism" and a "sustainable energy transition mechanism," engaging multilateral development banks and institutional investors in the process.[71] Implementing such systems and financial mechanisms at scale could meaningfully contribute to not only curbing carbon emissions but also promoting human and environmental health and prosperity, as well as security goals in the region.

CONCLUSION

South Asia faces the triple challenge of persistent under-development in spite of key economic successes, diverse and dense populations competing for limited resources, and climate change. Governments seeking to address the first two must also consider the third. Without due consideration, climate change will continue to be a major threat multiplier, exacerbating existing tensions and diminishing the options for peaceful co-development. Policymakers in security, foreign policy and energy policy domains should systematically assess the impact of current and projected climate change and take urgent, coordinated action to decrease vulnerability to climate impacts; reduce the incidence of climate-related security threats; and plan sustainable energy pathways at sub-national, national and regional levels. The international community too has an obligation to aid the parties in achieving these outcomes -- and will benefit from the confidence-building and trust that should ensue.

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