Climate Diplomacy

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BUILDING A CLIMATE FOR PEACE

Climate Security in South Asia

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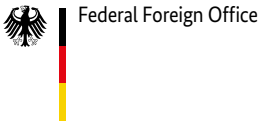

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BUILDING A CLIMATE FOR PEACE

Climate Security in South Asia

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LIST OF ABBREVIATIONS

BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
CANSA	Climate Action Network South Asia
CDRI	The Coalition for Disaster Resilient Infrastructure
CEM-SA	IUCN Commission on Ecosystem Management
DRM	Disaster Risk Management
HKH	Hindu Kush Himalayas
ICIMOD	International Centre for Integrated Mountain Development
IHR	Indian Himalayan Region
IMD	Indian Meteorological Department
IORA	Indian Ocean Rim Association
IPCC	Intergovernmental Panel on Climate Change
NDC	Nationally Determined Contributions
OECD	Organisation for Economic Co-operation and Development
SAARC	South Asian Association for Regional Cooperation
SACEP	South Asia Co-operative Environment Programme
SACRTF	South Asia Coral Reef Task Force
SASP	South Asian Seas Programme
SAWAN	South Asian Water Analysis Network
SAWGP	South Asia Water Governance Programme
SAWI	South Asia Water Initiative
SAYEN	South Asia Youth Environment Network
UNWC	UNWC Convention on the Law of the Non-navigational Uses of International Watercourses

EXECUTIVE SUMMARY

Climate uncertainty, when thrown into the mix of South Asia's vast and varied geography, rich biodiversity, and complex socio-economic makeup, leads to an interconnected web of risks for the region. Beyond a chequered history, the complexity of the region emerges from natural resources that have until recently been viewed as limitless. Through this report, we attempt to present a deeper understanding of the climate security risks posed to South Asia and an overview of the current policy landscape. More importantly, we also draw out future scenarios to understand the interconnectedness of these risks. A collaboration by adelphi and Kubernein Initiative, the report and its recommendations are a culmination of an intensive process of desk research, expert interviews as well as a virtual and in-person consultative workshop. Climate and security is not an entirely new field in the region, as e.g. recent work by IPCS and Clingendael on the Bay of Bengal shows (IPCS and Clingendael, 2022). We aim to build on existing knowledge and expertise to bring in new perspectives, connect seemingly disparate issues and offer actionable ideas in a region that has been disconnected for far too long.[1] The views presented here are of the organisations and do not necessarily reflect those of the participating experts who were generous with their time and knowledge.

2024 is a unique year in South Asia: 5 countries in the region conduct elections that affect over 2 billion people. Several of the issues being contested are shared across borders, from core development concerns to economic growth and prosperity to future risks arising from geopolitical tensions and an increasingly fractured world. And yet, despite so many commonalities, South Asia remains one of the least integrated regions in the world. The first section of the report traces the complexity of South Asia that arises from its varied topography, natural resources, and biodiversity. It highlights the need to consider identity politics of the region within the climate security ambit. Much of the identity politics is due to a shared history, including as part of the British empire, but whose darker sides contribute to an atmosphere of mistrust. A deeply diverse and heterogeneous region in terms of cultural, linguistic, religious and ethnic identities, the political demarcations that divide shared natural resources have long been a point of conflict within as well as between countries in the region.

Climate change has added uncertainty to existing vulnerabilities within this geographical context. Altering precipitation patterns, with rainfall now concentrated to a few weeks in the year, make groundwater recharge increasingly difficult and floods more frequent and severe. There is also evidence of land degradation or 'desertification', combined with rising heat days – April 2024 has already seen extreme temperatures that are unusual. These ecological impacts from climate change effect socio-economic and socio-cultural outcomes. Uncertain precipitation and extreme temperature adversely impact agricultural practices in the region that are increasingly water intensive (due to crop choice). Yet agriculture is crucial to the region's socio-economic security from a food security and livelihoods, but also an economic growth perspective. Any negative impact on socio-economic security can be critical in a region that is still amongst the poorest in the world. Despite significant progress in recent years, around 33.4 per cent of the world's extremely poor live in South Asia.

Despite the lack of integration, several attempts have been made over the decades to foster better trust and dialogue on shared issues and/or resources, some successful. Yet, most of these mechanisms are

1 This report uses adelphi's 2019 report 'Climate Fragility Risk Brief: South Asia' by Dr Dhanashree Jayaram as a starting point.

either highly fragmented or have a minimal understanding of climate security, with socio-economic impacts not considered. Some have served to begin a pathway that can be ultimately successful, though, and it is our belief that they could be re-imagined and re-booted with a strategic futures perspective. In the second section of the report we offer a study of existing mechanisms on environmental cooperation at the regional level in South Asia, where learning from these initiatives holds the potential to strengthen environmental collaboration. Frameworks and mechanisms such as the IORA, CDRI, ICIMOD and others exist to address climate change, but effective robust cooperation remains limited due to weak implementation, lack of funding, and concerns about data sovereignty. Yet, the very existence of many of these mechanisms in such a contentious region is a positive and can be used as means for further problem solving. This section considers Track I (Regional Intergovernmental Organisations) and Track II (Regional Non-governmental Organisations) Initiatives as well as Regional Initiatives on Transboundary Rivers. It also covers country-specific climate policy mechanisms that have primarily emerged from UNFCCC processes. While none of the South Asian states are historically big emitters, many have set mitigation targets and embraced low-emission pathways while also dealing with significant population and poverty challenges. There are obstacles to implementing these targets, including a lack of sufficient climate finance and technical cooperation, and in many cases there are tensions between development needs and environmental concerns. A more collaborative approach based on country specific needs could serve to alleviate many of these concerns and obstacles.

The third section of the report draws out four climate fragility risk scenarios to understand better the interconnectedness and extent of the impacts - social, cultural, ecological, and economic - in an area inhabited by billions. The first scenario considers the Water-Energy-Food-Environment (WEFE) nexus in South Asia, in the context of development needs, where the unknowns posed by climate change create further risks in already fragile ecosystems. Unpredictable rain patterns amidst the shortage in water storage infrastructure, alongside increasing heat waves and over-extraction of groundwater, will impact food and livelihood security in the region going forward. The impact on oceans will disrupt the marine economy, shipping routes and supply chains. Mountain communities will also face livelihood insecurity. The second scenario elucidates risks from the impact of climate change and unplanned growth on South Asia's rich and diverse ecosystems that are vital to the region's life, culture, and livelihoods. While most countries prioritise development and economic growth as the way, research and global knowledge indicate that countries no longer have to choose, and that rapid development of ecologically sensitive regions will ultimately create a long-term risk to the populations they portend to serve.

The third scenario considers the risks of climate change from a non-economic loss and damages perspective: it connects climate change to heritage loss. This impact is currently underexplored in the South Asian context, even though heritage is a key issue for many governments. Heritage is defined as the society's inherited culture, traditions, objects, places, and monuments, as well as meanings, knowledge, activities, and behaviours drawn from them (Chilton et al., 2010). Heritage loss due to climate change can be tangible (traditional sites or species) and intangible (festival, rites, traditional knowledge) (IPCC, 2022). We cannot afford to underplay the future risks that might arise from intangible losses to communities.

The fourth risk scenario looks at human migration and displacement, which according to the IPCC could be one of the "greatest single impact of climate change" (Brown, 2008). Even if the global community meets its climate commitments, researchers estimate that some 62 million people will be displaced across Bangladesh, India, Nepal, Pakistan, and Sri Lanka alone (Singh, 2020). And this is only from naturally occurring events or hazards that lead to disasters. Making a direct connection between climate change and migration remains a challenge as, natural calamity aside, there are usually several factors playing into a decision to migrate. These include more long-term impacts of climate change on the economy, livelihood, and weather patterns. Migration, even when internal, results in stronger intermingling of identities—be it religious, ethnic, or linguistic—that also increases the risk of conflict from identity politics.

The last section of the report considers possible avenues for future policy initiatives. Identifying gaps in existing mechanisms and dialogues, and learning from missed opportunities is an important step forward. It ensures that countries build on open channels of communication and trust, however feeble, and do not waste precious time and resources starting from scratch. However, such cumulativeness will not work without better systems of data collection, management, and analysis as a core aspect of better policy making, both within countries and across the region. Such improvements would also enable context-specific approaches to adaptation and resilience and a system of cross-learning, where community-led solutions can help plug gaps in existing mechanisms. Climate cooperation that can lead to security on all fronts, be it border or human, food or infrastructure, needs to be both a bottom up and top down. Here, the active involvement of women and other previously marginalised communities are key drivers of change and must be included in any resilience strategy in a visible manner. The section highlights several success stories, ideas that can be brought to similar ecosystems across South Asia. If we are truly serious about a climate secure future that places human security at its core, we need a concentrated effort that combines better policies and collaborative frameworks with both modern science and a conscious building on indigenous knowledge. Above all, we need a more inclusive approach.

1. STATE OF PLAY: MULTIVERSE OF IDENTITIES, ECOLOGY AND CRISES

South Asia stretches from the high peaks of the Himalayas to the fertile delta of Bangladesh; it includes the arid deserts of the Thar and the lush mangroves of the Sundarbans. Characterised as a sub-continental landmass, it is also home to archipelagos with thousands of islands. It has a unique topography, where the salty marsh of Kutch coexists with the wettest places on the planet, and an extensive coastline borders the turbulent Indian Ocean.[2]

The Hindu Kush Himalayas (HKH), stretching over 3,500 km, are a prominent feature of the South Asian geography, characterised by some of the world's highest peaks, including Mount Everest, K2, and Kangchenjunga. They are a "geo-ecological asset" with four global biodiversity hotspots, 330 important bird areas (Chettri et al., 2008), hundreds of mountain peaks over 6 kms with varying altitudinal zones and climatic conditions that allow a diverse range of flora and fauna to thrive.

The region is home to rich water resources that transverse national boundaries. The HKH, referred to as Asia's water tower, contain the largest snow and ice concentration outside Antarctica and the Arctic. Ten rivers originate in this region that sustain 1.9 billion people across eight countries—Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar, and Pakistan. Several factors tying back to this varied geography and socioeconomic makeup add to regional climate security risks.

1.1 DEMOGRAPHY AND IDENTITIES

South Asia is a deeply diverse and heterogeneous region in terms of cultural, linguistic (approximately 650 spoken languages from four language families) (The Hindu, 2018), religious and ethnic identity. Political demarcations that force sharing of common resources have long been a point of conflict within as well as between countries in the region. For example, water-sharing disputes at the sub-national level in India, such as the Cauvery River water-sharing dispute between Karnataka and Tamil Nadu, or the Sutlej-Yamuna Link Canal, run parallel with identity politics (Siddiqi & Tahir-Kheli, 2004).

Identity politics further adds to anxiety and an atmosphere of mistrust in the region. This identity politics is primarily due to the shared history between the nations, many of which were part of the British colony. For example, the Tamils in India share strong sentiments with the Tamils in Sri Lanka. Similarly, minority and majority religions, as well as ethnic classes, share ideologies and beliefs that transverse national boundaries (Panikkar, 2011).

1.2 LAND, COASTS AND MOUNTAINS

South Asia has an 11,872.60 km long coastline that is vulnerable to floods, rising sea levels, water salination, cyclones, coastal erosion, ocean acidification, and other ecosystem damage. Low-lying island countries of Sri Lanka and Maldives are susceptible to storm erosion and chronic coastline recession.

2 Mawsynram and Cherrapunji in Meghalaya, India.

In Sri Lanka for example, the coastal land is less than 1 metre above sea level (Mehvar et al., 2019). In the Maldives, the average height of islands is 1.5 metres above sea level, with the highest point less than 2 metres above sea level (Kapoor, 2020). In India, 26 per cent of the coastline is prone to erosion, with 450 hectares of land lost yearly (Asian Development Bank, 2017).

Climate change has altered precipitation patterns, with rainfall now concentrated to a few weeks in the year, making groundwater repletion and recharge increasingly difficult, and floods more frequent and severe. The Indian Himalayan Region (IHR) alone has 9,575 glaciers, with several retreating at various rates. These glaciers cover approximately 36,000 km^2 and constitute an ice volume of about 2,000 km^3 (Government of India, 2019).

The region is home to some of the largest deserts—Thar desert, the Rann of Kutch, and Northwestern Balochistan—that are experiencing higher temperatures. Intergovernmental Panel on Climate Change (IPCC) evidence from 1920–2015 suggests that surface warming in deserts and arid regions at 1.2–1.3°C was higher than warming over humid lands at 0.8–1.0°C (PTI, 2023). South Asia is also experiencing land degradation, termed as 'desertification', within arid, semi-arid and dry sub-humid regions. Data from India shows an increase in degraded land from 96.32 million hectares in 2011–2013 to 97.84 million hectares in 2018–2019 (PTI, 2022), with the largest desertification observed in Rajasthan, Maharashtra, and Gujarat.

The changing climate in the region is exacerbated by increasing levels of air pollution. For instance, black carbon can settle on ice and snow, reducing its reflectivity (albedo effect), and hence causing it to absorb more heat and accelerate melting. Of the 20 most polluted cities in the world, 14 are from India, and 3 are from Pakistan. The entire population of Afghanistan, Pakistan, India, Nepal, Bhutan, and Bangladesh is exposed to air pollution levels exceeding WHO guideline values.

1.3 SOCIO-ECONOMICS AND LIVELIHOODS

South Asia has made significant socio-economic progress in recent years, yet it remains one of the poorest regions in the world. Around 33.4 per cent of the world's extremely poor live in South Asia, with roughly 212.2 million people living under less than USD 1.9 per day (2011 dollars) (Islam et al., 2018). Poverty in the region is multidimensional. For example, a South Asian citizen on average lives 11 years less due to poor access to healthcare compared to citizens of Organisation for Economic Co-operation and Development (OECD) countries.

RANN OF KUTCH LAKE IN KACHCHH, INDIA

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Table 1: **South Asia, A Snapshot**

COUNTRY/ REGION	POPULATION (IN MILLIONS AS OF 2022)	POVERTY HEADCOUNT RATIO AT NATIONAL POVERTY LINES (% OF THE POPULATION)	LIFE EXPECTANCY AT BIRTH (2021)	PERCENTAGE OF POPULATION USING SAFELY MANAGED DRINKING WATER (2020)	HOSPITAL BEDS (PER 1,000 PEOPLE; 2012-17)	PREVALENCE OF SEVERE WASTING, WEIGHT FOR HEIGHT (% OF CHILDREN UNDER 5; 2016-18)	HUMAN DEVELOPMENT INDEX VALUE	LENGTH OF COASTLINE INCLUDING ISLANDS (IN KMS)
Afghanistan	41.12	54.5	62	27.6	0.4	1.6	0.478	0
Pakistan	235.82	21.9	66	35.6	0.6	2.4	0.544	1046
India	1,417.17	21.9	67	50*	0.5	4.9	0.633	7516.6
Nepal	30.54	25.2	68	17.6	0.3	2.9	0.602	0
Bhutan	0.78	12.4	72	36.6	1.7	n/a	0.666	0
Bangladesh	171.18	18.7	72	58.5	0.8	2.3	0.661	1320
Sri Lanka	22.18	14.3	76	90	4.2	3.1	0.782	1340
Maldives	0.52	5.4	80	99.54	4.3	2.0	0.747	650
South Asia	1,919.34	N/a	68	N/a	0.6	4.5	n/a	11,872.6

Source: World Bank (n.d.)

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A FARM OUTSIDE OF LUDHIANA USES A COMBINATION OF TRADITIONAL AND GREENHOUSE AGRICULTURE, PUNJAB

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Agriculture is crucial to the region's socio-economic security both from a food security and livelihoods perspective. The agricultural sector is the largest employer in the region, except in Bangladesh (Khan & Salik, 2024). Agriculture also consumes the lion's share of freshwater resources (England & Villholth, 2022) and is a big contributor to groundwater depletion, along with water extracted to meet the demands of an increasing population. The groundwater abstraction—especially for irrigation—in India for example, far exceeds that of China. An average Indian farmer uses 2–4 times more water to produce a unit of a major food crop than farmers in China or Brazil (Dhawan, 2017). Levels of micro-irrigation are low and dependence on monsoon high.

In May 2022, the Government of India banned the export of wheat as part of measures to control rising domestic prices and ensure food security. A severe heatwave across much of Northern India meant a drastic fall in the output of wheat. The heatwave coincided with the critical reproductive growth period of the crops (Khan & Salik, 2024). The March of 2022 was reported to be the hottest in the past 122 years and the same trend was witnessed in 2023, with abnormally high temperatures in February 2023.

2. POLICY MECHANISMS IN CLIMATE ACTION

2.1 REGIONAL COOPERATION MECHANISMS

Understanding environmental cooperation at a regional level in South Asia becomes necessary to identify gaps and ensure that mechanisms are realistic given existing constraints. Existing mechanisms on environmental cooperation are highly fragmented, and the overall understanding of climate security with socio-economic impacts is still missing. While some frameworks and mechanisms, such as the IORA, CDRI, ICIMOD and others, exist to address climate change, effective robust cooperation remains limited due to weak implementation, lack of funding, and sovereign data concerns. Yet, even as we call for more innovative and bold thinking on South Asia's approach to tackle the climate crisis, often working within existing policy spaces becomes a useful entry point for achieving cascading success.

Presented below is a list of Track I (Regional Intergovernmental Organisations), Track II (Regional Non-governmental Organisations) Initiatives and Regional Initiatives on Transboundary Rivers that have varying degrees of direct or indirect influence over environmental cooperation and regional cooperation in South Asia. The effective utilisation of these initiatives holds the potential to strengthen environmental collaboration in the region. Track II processes in South Asia have historically played a limited role in shaping regional politics. However, their increasing influence in driving cooperation cannot be overstated. While it often seems that there is an absence of tangible actions and concrete long-term output, the very existence of many of these mechanisms in such a contentious region is a positive and can be used as means for further problem solving.

THIMPHU, BHUTAN

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Table 2: **List of Track I, Track II and Other Regional Initiatives on Environmental Cooperation**

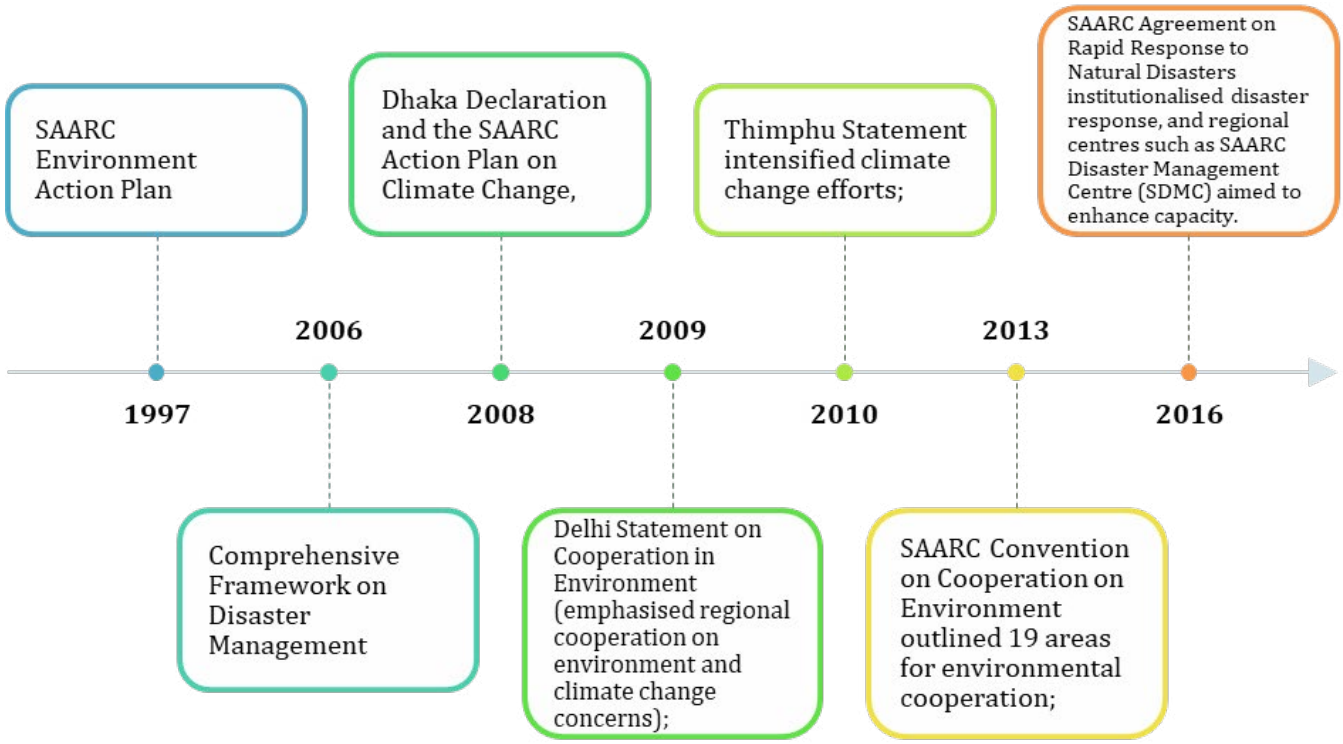
SR NO	TRACK I INITIATIVES (REGIONAL INTERGOVERNMENTAL ORGANISATIONS)	TRACK II INITIATIVES (REGIONAL NON-GOVERNMENTAL ORGANISATIONS)	REGIONAL INITIATIVES ON TRANSBOUNDARY RIVERS
1	South Asia Co-operative Environment Programme (SACEP)	IUCN Commission on Ecosystem Management (CEM-SA)	South Asian Water Analysis Network (SAWAN)
2	South Asian Seas Programme (SASP)	South Asia Youth Environment Network (SAYEN)	South Asia Water Governance Programme (SAWGP)
3	South Asia Coral Reef Task Force (SACRTF)	Climate Action Network South Asia (CANSA)	South Asia Water Initiative (SAWI)
4	International Centre for Integrated Mountain Development (ICIMOD)		
5	South Asian Association for Regional Cooperation (SAARC)		
6	The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)		
7	Indian Ocean Rim Association (IORA)		
8	The Coalition for Disaster Resilient Infrastructure (CDRI)		
7	Indian Ocean Rim Association (IORA)		
8	The Coalition for Disaster Resilient Infrastructure (CDRI)		

Source: Hossain, S. 2022

SAARC

Climate change, while not a primary focal point of cooperation, falls within the purview of environmental and disaster cooperation, which has been a key area of collaboration in the South Asian Association for Regional Cooperation (SAARC) since 1987. The focus on addressing the challenges posed by climate change and natural disasters was rooted in the recognition that these issues can significantly jeopardise the development trajectory within the region. In its active engagement, SAARC as a regional cooperation body has taken significant steps in addressing environmental and disaster challenges by commissioning studies, and through various plans, declarations, and agreements.

Figure 1: **Timeline of SAARC engagement on environmental and disaster risk cooperation**



Source: Kubernein Initiative

However, even as the region faced increasing disasters due to climate change in the past decade, the SAARC Environment Ministers' meetings have been discontinued since 2011 and no summits have taken place since 2014. The discontinuation of SAARC environment meetings and summits, amidst continuous political tensions hamper the effective functioning of what could potentially be a key regional cooperation mechanism in South Asia.

ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD)[3] is an intergovernmental institution established by eight Regional Member Countries (RMCs), including six South Asian nations: Afghanistan, Bangladesh, Bhutan, India, Nepal, and Pakistan. Governments of RCMs provide support and strategic guidance to ICIMOD.

The focus of ICIMOD is on three strategic groupings—reducing climate change and environmental risks, shaping green and inclusive mountain economies, and enabling regional mechanisms for sustainable action. ICIMOD operates across six action areas: managing cryosphere and water risks, stimulating action for clean air, adapting, and transforming livelihoods and economies, restoring, and regenerating landscapes, building institutions for regional cooperation and collaboration, and strengthening global leadership in sustainable mountain development. The organisation plays a vital role in transboundary cooperation, filling data gaps through creating knowledge of the Hindu Kush Himalayas (HKH) region, institutionalising evidence-based policymaking, promoting regional integration on critical issues, and enhancing partnerships.

BIMSTEC

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation[4] (BIMSTEC) was established in June 1997, with Bangladesh, Bhutan, India, Nepal, and Sri Lanka as members. While trade and economic cooperation are the primary focus, BIMSTEC was quick to recognise the rising impacts of climate change on trade and livelihoods and played a crucial role during the 2004 Indian Ocean Tsunami. The Fifth BIMSTEC Summit (March 2022) also introduced Environment and Climate Change with Mountain Economy as a priority sub-sector, with Bhutan as the lead. There is great potential for BIMSTEC to be the alternative disaster risk governance mechanism in the Bay of Bengal region, with possible collaboration with South East Asia and ASEAN countries.

IORA

The Indian Ocean Rim Association (IORA) is an intergovernmental organisation for enhancing regional cooperation and sustainable development in the Indian Ocean region. South Asian states of Bangladesh, India, and Sri Lanka are part of this 23-member coalition, which also has 11 dialogue partners. Disaster Risk Management (DRM) is a priority area and IORA acknowledges DRM as a multidisciplinary concept involving various stakeholders such as national governments, non-governmental organisations, regional and international partners, donors, civil society, and the private sector. IORA actively promotes partnerships between governments and institutions to bolster this priority area, including developing joint training programmes, sharing experiences and best practices, building capacity, and enhancing technical capabilities within the region. It offers an opportunity for cross-learning with other regional mechanisms that are more South Asia focused to enhance community resilience to climate change-driven disasters and hazards.

3 https://www.icimod.org/

4 https://bimstec.org/bimstec-history/

CDRI

The Coalition for Disaster Resilient Infrastructure (CDRI) is a global partnership mechanism to enhance and fortify resilience of infrastructure systems against existing and future climate shocks and disaster-related challenges. It is led by India, and includes Afghanistan, Bhutan, Bangladesh, Nepal, Maldives, and Sri Lanka as member countries. CDRI has outlined a set of strategic initiatives designed to facilitate collaboration and an exchange of knowledge and best practices. Given the extent of interdependency of transboundary resources across the region, the CDRI offers a unique gateway for cooperation to future proof against potential cascading risks. The value of resilient infrastructure will also be crucial in post-disaster recovery and mitigating displacement to a great extent.

TRANSBOUNDARY WATER TREATIES

Climate insecurity often manifests as alterations in the water cycle and water security. The rivers that intricately traverse the subcontinent serve as vital resources for the billions inhabiting South Asia. The rivers that originate in the region run across multiple countries—some of whom have territorial disputes and are not signatories to the UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UNWC), making cooperation on these international rivers difficult. The prevailing model of cooperation has predominantly been bilateral, lacking trilateral or multilateral frameworks. Many existing treaties have not been fully implemented, while others are not updated to reflect changing realities of demand, population expansion or changes in the environment and climate.

Presently, none of the existing treaties, except for the recent Bhutan-India Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers Common to India and Bhutan, incorporates climate considerations. However, through amendments that include elements like detailed assessments, establishment and joint monitoring of hydro-meteorological stations, flood forecasting and early warning systems, data sharing and flood management, these treaties can be revitalised to enhance climate resilience. Community involvement can play a crucial role to foster mutual trust and cooperation amongst the states, building on existing successes.

THE CONFLUENCE OF THE INDUS AND THE ZANSKAR RIVERS, LADAKH

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Table 3: **Analysis of Climate Considerations in South Asia Water Treaties and Agreements**

COUNTRY	WATER TREATIES AND AGREEMENT	CLIMATE CONSIDERATIONS
Bangladesh-India	India-Bangladesh Agreement on Ganga, 1977 India-Bangladesh Agreement on Ganga, 1996 Teesta Draft Treaty from 37th Joint Rivers Commission Protocol on Inland Water Transit and Trade Second Addendum to Protocol, 2020	No
Bhutan-India	Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers Common to India and Bhutan, 2023	Yes - Includes 32 Hydro-meteorological/ meteorological stations in Bhutan for flood forecasting and management
India-Nepal	India-Nepal Agreement on Gandak, 1959 India-Nepal Agreement on Kosi, 1954 India-Nepal Agreement on Kosi, 1966 Kosi Treaty, 1975 Gandak Treaty, 1975 Mahakali Treaty, 1996	No
India-Pakistan	Indus Waters Treaty, 1960	No

Source: Treaties | Water Beyond Borders (n.d.)

2.2 DOMESTIC CLIMATE ACTION AND ADAPTATION MECHANISMS

Climate policy mechanisms in the South Asian region have primarily emerged from UNFCCC processes. All eight South Asian countries are signatories of the Paris Agreement and have established and recently updated their Nationally Determined Contributions (NDCs). Apart from Afghanistan, India, and Maldives, all countries in the region also have National Adaptation Plans to address the impacts of climate change. A brief overview of each state's NDC targets (listed below) shows strong commitment and intent towards serious action. While none of the South Asian states are historical emitters, many have set mitigation targets and embraced a low-emission pathway while also dealing with significant population, poverty, and challenging physiography. There are obstacles to implementing these targets, including a lack of sufficient climate finance and technical cooperation, and in many cases the tension between development needs and environmental concerns.

Table 4: **South Asia NDC targets and Adaptation Plans**

COUNTRY	NDC OVERVIEW	NATIONAL ADAPTATION PLANS
Afghanistan	13.6% reduction in GHG emissions by 2030 compared to the BAU 2030 scenario (conditional).	No
Bangladesh	GHG emissions are to be reduced by 27.56 Mt CO2e (6.73%) below BAU by 2030 (unconditional). GHG emissions would be reduced by 61.9 Mt CO2e (15.12%) below BAU in 2030 (conditional).	Yes
Bhutan	Maintain the commitment to remain carbon neutral.	Yes
India	Reduce the emissions intensity of GDP by 45% by 2030, from the 2005 level. Achieve 50% of cumulative electricity from non-fossil fuel-based energy resources by 2030. Create an additional carbon sink of 2.5 to 3 billion tonnes of CO2e through additional forest and tree cover by 2030.	No
Maldives	Achieve 70% renewable energy in electricity generation by 2030.	Yes
Nepal	By 2030, expand clean energy generation from approximately 1,400 MW to 15,000 MW. By 2030, develop 200 km of the electric rail network to support public commuting and mass transportation of goods.	No
Pakistan	50% reduction of projected emissions by 2030, with 15% drop below BAU (unconditional), and an additional 35% drop below BAU (conditional).	Yes
Sri Lanka	Increase forest cover 32% by 2030 and reduce GHG emissions by 14.5% for the period of 2021-2030 from Power (electricity generation), Transport, Industry, Waste, Forestry, and Agriculture. Achieve 70% renewable energy in electricity generation by 2030.	Yes

Source: Treaties | Water Beyond Borders (n.d.)

3. CLIMATE FRAGILITY RISK SCENARIOS

Over the past decade, climate change has impacted the fragility of South Asia through small, seemingly insignificant changes in weather patterns as well as large climatic events, such as floods, Himalayan glacial outburst floods and landslides, super cyclones in the Bay of Bengal, and heat waves across the subcontinent. The potential for escalation of these hazards, as well as their interconnected nature, in an area inhabited by millions, can impact the social, cultural, ecological, and economic fabric of the region.

3.1 COMPOUNDED RISKS OF WATER, WEATHER AND ECONOMIES

Water, in its various forms, is central to the lives and livelihoods of millions living in the region. IPCC data and the Hindu Kush Himalayan Assessments indicate an increase in the frequency and intensity of fragility risks within the region. This, combined with existing development trajectories, leads to compounding risks. Globally, there is a consensus that the problems of water, food production, energy generation, and the environment are interconnected and interdependent. This Water-Energy-Food-Environment (WEFE) nexus is also apparent in South Asia. For example, the Himalayas are amongst the youngest mountain ranges in the world[5] and are tectonically active. Yet, there are 411 dams under construction in India alone, with most of them at the foothills of the Himalayas (Government of India, 2016). Much of this construction is to generate hydropower, which is an important element in India's energy transition and 2030 target of 500 GW from non-fossil fuel sources (Rajshekhar, 2022). The need for development, combined with already fragile ecosystems and the unknowns posed by climate change, create significant risks for the over 240 million people residing in the hills and mountains that are directly dependent on the ranges for food, water, and energy (Sharma et al., 2019).

Unpredictable weather patterns and extreme weather events are disturbing agro-ecosystems and impacting farmers and farming communities (Government of India Ministry of Finance, 2018). The concentration of monsoon to a few weeks annually and the increased intensity of rainfall leads to increased runoff and soil erosion (Kumar et al., 2023). Most South Asian countries have very low levels of water storage, which makes agriculture monsoon-dependent and increases water insecurity at the household level. Nepal and India receive 80 per cent of their total precipitation from June to September, making it difficult to meet their water requirements with low levels of storage (Sigdel & Ikeda, 2012; Biswas, 2008). Surface water storage infrastructure is virtually non-existent in Nepal, which stores less than one per cent of its total annual runoff with no reservoirs (Jeuland et al., 2013). Per capita storage of water in India is at 220 cubic metres compared to 2200 cubic metres in China, 5000 cubic metres in Australia and 6000 cubic metres in the United States (Qureshi, 2011). While the Murray-Darling River basin and the Nile River store 100-200 per cent of the mean annual flow for multi-year storage and operations, Ganga stores less than 10 per cent of its annual runoff (Sadoff et al., 2013).

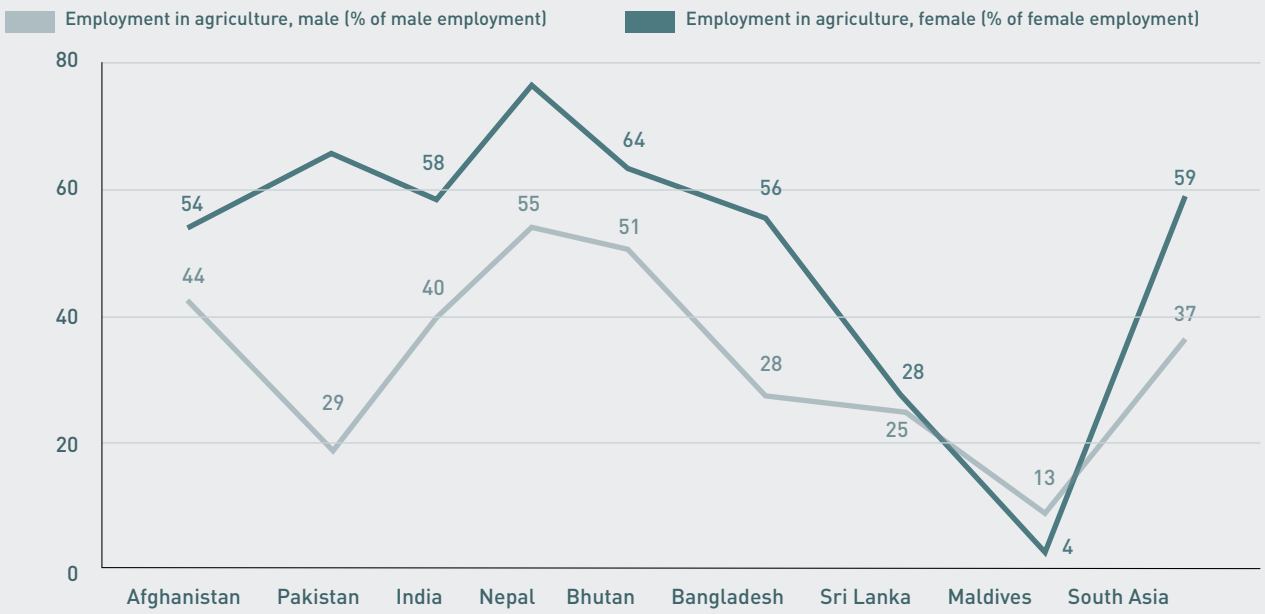
The agricultural sector adds further pressure on water tables in various ways: prioritising crops like rice, sugar and wheat that are water-intensive; continuing the practice of flood irrigation; distributing water in open canals; providing subsidies for water extraction; and charging water use based on the area irrigated instead of the volume of water consumed (Dhawan, 2017). The shortfall in storage infrastructure along with the over-extraction of groundwater and groundwater table depletion, will impact food and livelihood security in the region going forward. The situation will only be made worse by increasing and unpredictable heat waves, especially during the flowering and maturing

5 The Himalayas are just 45 million years old compared to the North American Appalachians (440–480 million years) or the Aravallis in India (around 4,000 million years old).

period, that lead to a loss in yield (Khan & Salik, 2024). The abnormal rise in temperature in March 2022 drastically impacted crop yields in India, with the Indian Meteorological Department (IMD) releasing a press statement warning that high temperatures would negatively impact wheat output in northwest, central, and western India.

Poor and marginal farmers that cannot afford to invest in the modernisation of their farms or in technologies that build resilience will face greater impact.[6] Beyond the loss of yield, increasing temperatures, and unpredictable weather patterns affect the livelihoods of communities as agriculture (which includes agriculture, hunting, forestry and fishing) remains the largest employer in South Asia, providing jobs for 59 per cent of its male population and 37 per cent of its female population (World Bank Open Data, n.d.). The increasing trend of young men seeking employment in urban areas has resulted in a greater dependence of the female workforce on agriculture-related livelihoods.

Figure 3: Employment in agriculture by country



Source: World Bank

Climate change will affect freshwater and marine environments, causing damage to human health, environment, and economies. Around 2.3 per cent of South Asia's population, approximately 43.7 million people, live in areas where the elevation is below 5 metres. Sea levels are expected to rise 15–38 centimetres in India and 45 centimetres in Bangladesh by 2050 (World Bank Open Data, n.d.). In Bangladesh and along the eastern coast of India, the intensity of tropical cyclones is predicted to increase

6 These could be storage of water, drip-irrigation, insurance, etc.

by 5–10 per cent and precipitation rates are predicted to increase by 20–30 per cent by 2050 (IPCC, 2001). The warming of oceans and seas, changes in salinity, nutrient runoff, sea level rise, changes in rainfall, coastal upwelling, higher CO2 levels and low oxygen levels in water impact fish diversity, their distribution, abundance, and phenology (Bal Kumar et al, 2022). These events will disrupt the marine economy, tourism and other small-scale enterprises that depend on the coast, as well as lead to economic loss to large metro cities through loss of shipping routes and supply chain disruptions. Communities relying on mountains may face similar livelihood insecurity arising out of changing habitats, biodiversity loss, and altered ecosystems.

3.2 ECOSYSTEM AND TERRITORIES

South Asia stands out for its rich and diverse ecosystems such as the cryosphere of the Hindu Kush Himalayas, the Thar desert, vast coastlines, Sundarbans delta, and rainforests, and is home to four global biodiversity hotspots. Its rich and diverse ecosystems are integral to the region's life, culture, and livelihoods. The severe impacts of climate change, compounded by decades of maldevelopment and unplanned growth, unregulated pollution, inadequate consideration of environmental issues, suppression of public participation in environmental decision-making and a peak in democratic weakening in South Asia (Gupta, 2023), are causing alarming and potentially irreversible changes to these ecosystems. Such changes can have significant consequences for human security: scholars have estimated that the (unintended) extinction of vultures in India through a pesticide led to about 500,000 premature human deaths between 2000 and 2005 (Economist, 2023).

Various ecosystems in South Asia (South Asia Co-operative Environment Programme, 2016b), including coastal systems like mangroves, mudflats, and estuaries; coral reefs; inland wetlands; forests; temperate and alpine mountains; glaciers; deserts; rangelands and grasslands; freshwater bodies; and species diversity, are all facing significant threats. The Hindu Kush Himalayas (HKH), a vital water source, now face increased droughts, flash floods, glacial lake outburst floods, cloudbursts, and landslides across different seasons (Rathore, 2023). Meanwhile, the lifelines of the region, its rivers and groundwater, are deteriorating, unable to sustain their ecological and environmental flows.

In February 2021, a landslide in Uttarakhand's Dhauliganga Valley occurred when a glacier—the size of 15 football fields long and five across—broke off from the steep face of a mountain, plunged, and brought with it an avalanche of rock and ice into the Ronti Gad. This landslide led to the death of at least 58 people. Though it is difficult to ascertain the exact cause of the sliding of the hanging glacier or how this landslide triggered the flash flood, opposition to dams and attempts to interfere with the Himalayas' fragile ecology have received renewed support[7] (Shugar et al., 2021). Of the 8800 glacial lakes in the Himalayas, 200 have been classified as dangerous (Pandit, 2013).

7 Experts studying the disaster suggest that following the landslide, the ensuing debris may have halted the flow of the Rishi Ganga River and caused the formation of a temporary lake. The formation of natural dams by debris and sediments, either by landslides or glacier retreats, are called moraines, and these moraines contain meltwater within. According to a team of scientists that analysed satellite imagery, seismic records, numerical model results, and eyewitness videos, the breaching of this moraine led to the flash floods.

Table 5: **Country Data on Forest Cover, Tree Cover and Threatened Ecosystems**

COUNTRY	FOREST AND TREE COVER LOSS	THREATENED ECOSYSTEMS
Afghanistan	In 2010, Afghanistan had 71.8 kha of tree cover, extending over 0.11% of its land area. By 2022, it lost 6 ha of tree cover.	Inland Wetlands; Mountains; Glaciers; Desert; Rangeland and Grasslands; and Freshwater.
Bangladesh	In 2010, Bangladesh had 2.22 Mha of tree cover, extending over 16% of its land area. By 2022, it lost 13.8 kha of tree cover, equivalent to 8.07 Mt of CO_2 emissions.	Coasts; Freshwater and Species Diversity.
Bhutan	In 2010, Bhutan had 2.51 Mha of tree cover, extending over 65% of its land area. By 2022, it lost 1.25 kha of tree cover, equivalent to 706 kt of CO_2 emissions.	Forests; Mountains and Glaciers.
India	In 2010, India had 31.3 Mha of natural forest, extending over 11% of its land area. By 2022, it lost 117 kha of natural forest, equivalent to 62.9 Mt of CO_2 emissions.	Coast; Coral Reefs; Inland Wetlands; Forests; Alpine Mountains; Glaciers; Desert; Rangeland and Grasslands; Freshwater and Species Diversity.
Maldives	In 2010, Maldives had 2.79 kha of tree cover, extending over 10% of its land area. By 2014, it lost 3 ha of tree cover.	Coast; Coral Reefs and Freshwater.
Nepal	In 2010, Nepal had 4.80 Mha of natural forest, extending over 33% of its land area. By 2022, it lost 2.02 kha of natural forest, equivalent to 1.17 Mt of CO_2 emissions.	Forest; Mountains; Glaciers; Freshwater and Species Diversity.
Pakistan	In 2010, Pakistan had 648 kha of tree cover, extending over 0.74% of its land area. By 2022, it lost 49 ha of tree cover, equivalent to 19.3 kt of CO_2 emissions.	Inland Wetlands; Alpine Mountains; Glaciers; Desert; Rangelands and Grasslands; and Freshwater.
Sri Lanka	In 2010, Sri Lanka had 3.53 Mha of natural forest, extending over 54% of its land area. By 2022, it lost 8.40 kha of natural forest, equivalent to 3.40 Mt of CO_2 emissions.	Coast; Coral Reefs; Inland Wetlands; Forest; and Species Diversity.

Sources: Global Forest Watch, n.d.; South Asia Co-operative Environment Programme, 2016b

A deadly trio of biodiversity loss, climate change impacts, and a pollution crisis are all interacting and rapidly reshaping ecosystems and their relationships with people and growth potential. These changes in the ecosystems and territories are driving migration (Rathore, 2023a) and internal displacements that adversely impact women and marginalised communities. While there are some responses, such as Odisha and planned relocations to cope with sea-level rise and territorial loss, or Bangladesh farmers (Paul, 2022) reviving measures like floating farming techniques, they are far and few between.

3.3 NON-ECONOMIC LOSS AND DAMAGE

Academic and policy circles have only recently begun looking at the impact of climate change on tangible and intangible cultural heritage. Scholars have defined heritage as the society's inherited culture, traditions, objects, places, and monuments, as well as meanings, knowledge, activities, and behaviours drawn from them (Chilton et al., 2010). Brooks et al. (2020) point out that heritage not only plays an essential economic role in supporting the livelihoods of communities but is also necessary for the construction and reinforcement of identity and the psychological well-being of society.

The Sixth Assessment Report of the IPCC (IPCC, 2022) draws attention to the tangible and intangible heritage that is being lost because of climate change. Tangible heritage is described as "traditional harvesting sites or species and archaeological and cultural heritage sites". Climate change impacts from storm surges, rising sea levels, saltwater intrusion, heavy rainfall, hurricanes, flooding, and extreme heat on the rich cultural heritage of the region have already manifested.

Examples of tangible heritage loss from climate change in South Asia

Caves at the Golden Rock Temple of Dambulla, a UNESCO World Heritage Site in Sri Lanka, have suffered extensive surface whitening and other forms of decay. The monitoring of surface temperatures of the interiors using geostatistical data to map and identify areas of high temperature and moisture zones, combined with the evaluation of the percentage of decay in the caves reveals a "significant relationship between the usable area within the cave and the process of decaying due to changing parameters influenced by the climatic seasons of the year" (Rajapaksha, 2020b).

In 2022, record-breaking rains and floods in Pakistan caused significant damage to Mohenjo Daro, a UNESCO World Heritage archaeological site dating back over 4,000 years. The heavy rainfall, attributed to climate change, led to the collapse of several walls and structures at the site, raising concerns about the preservation of this ancient civilization's remnants. Experts emphasize the urgent need for conservation efforts and infrastructure improvements to safeguard the invaluable cultural heritage of Mohenjo Daro against future environmental threats (Afp, 2022).

In New Delhi, India, during the early monsoon period of 2023, the Yamuna River overflowed, and iconic heritage sites such as the Red Fort, Shah Alam's tomb, Qudsia Mosque and the over 700-year-old Wazirabad Bridge were inundated (Chakrabarty, 2023).

Bangladesh is home to "Mosque City"—a UNESCO World Heritage Site of 360 mosques and mausoleums from the mid-15th century—where disintegration of bricks and masonry has been observed, with some reports also suggesting increased discoloration (Taylor, 2022). The intrusion of saltwater is one factor impacting the region's cultural heritage sites. Bangladesh Soil Resource Development Institute reports that salinity in the coastal region has increased from 833,000 hectares in 1973 to over a million hectares in 2009. This increase is attributed to large cyclones hitting the country since 2005. Overall, Bangladesh's Department of Archaeology estimates (Hossain M., 2022) that at least 50 of the 127 protected sites in the country's coastal districts are already facing damage from the worsening climate.

Intangible heritage loss is measured in the "festivals and rites associated with nature-based activities, endemic knowledge and unique insights about plants and animals" (IPCC, 2022) that are impacted by climate change. For example, in Sri Lanka, changes in lifestyles due to climate change, such as migration or changes in livelihoods from traditional trades to modern jobs, continue to impact the indigenous knowledge and cultural heritage of the island nation, sometimes leading to the loss of folklore and oral traditions.

At present however, the research connecting climate change to heritage loss remains largely limited to European and North American academic circles (Brooks et al., 2020). There is a need to gather more information and in-depth research into some of these connections for the South Asian region to create stronger safeguards for the future.

3.4 HUMAN MIGRATION AND DISPLACEMENT

In the early 1990s, the IPCC noted that the "greatest single impact of climate change could be on human migration—with millions of people displaced by shoreline erosion, coastal flooding and agricultural disruption" (Brown, 2008). The International Organisation on Migration predicts the world will have 200 million climate migrants by 2050 (International Organization for Migration, 2008). According to Action Aid and Climate Network South Asia, even if the global community meets its climate commitments, an estimated 62 million people will still be displaced across Bangladesh, India, Nepal, Pakistan, and Sri Lanka alone (Singh, 2020).

Estimating the number of people who are climate migrants remains a challenge however, as barring a tangible natural calamity, there is often more than one factor that plays into the decision to migrate. For instance, the impacts of climate change over time, along with economic impacts that may or may not be related to climate can lead to migration. Hence, climate migration due to sudden onset weather events are easier to calculate as compared to gradual events like depleting water tables, coastal erosion, saline water intrusion, low irrigation yields, weather patterns, etc.

Climate change will have knock-on effects on livelihood security. Communities migrating to safer spaces following a cyclone, for example, may find it difficult to secure their livelihoods in a new setting. The forced intermingling of identities—be it religious, ethnic, or linguistic—also increases the risk of conflict from identity politics.

4. OPPORTUNITIES FOR INTERVENTION

Beyond a tumultuous history, South Asian countries share more than they would like to admit, from rivers, oceans, and mountains to monsoons, heat, and pollution. The common impacts of climate change require collective action, which not only makes ecological sense but also strategic sense. Through increased collaboration, the exchange of best practices, and shared learning, countries in the region can enhance their adaptation and resilience efforts and strengthen their collective voice as a bloc in global multilateral platforms. Recognising the gravity of climate change as a vital security issue is crucial not only for long-term national and regional security, but also the economic prosperity that the countries seek.

A policy ecosystem needs to be created for adapting climate solutions that integrate security and fragility risks. Implications of climate change in regional geopolitical dynamics will have spill over effects globally, and it is in the larger interest of the global community to aid in these efforts. Implementing strategic measures to address foreign policy implications resulting from the overlap of climate change and security is imperative. There is no other way.

Through our research and building upon the extensive work done by other organisations, alongside regional consultations, and a two-day workshop with a wide selection of experts not often brought into these conversations, we have put together a set of entry points to address climate fragility risks. Many of these are already in play in some form or another. In these cases, we highlight existing gaps that can be addressed. Others require imagination and political will, which we argue exists in the region in other spheres and needs to be translated in this space. The region is one of the least integrated in the world; it is time we changed that.

4.1 REINVIGORATING INSTITUTIONS: WORKING WITHIN EXISTING MECHANISMS

As formal collaboration among South Asian states is limited, regional challenges are often compounded by a lack of data and trust, leading to insufficient cooperation towards long-term solutions. The lack of robust regional mechanisms is a growing gap. Challenges range from escalating conflicts among fishing communities in the Indian Ocean to cross-border tensions between communities after devastating floods or other natural hazards. There is a degree of cooperation in areas such as disaster relief and military cooperation among member states. However, a substantial opportunity exists for knowledge transfer, including the identification of common gaps and needs, gathering data and institutionalisation of loss and damage funds, ensuring a just transition, understanding human mobility patterns, and conducting evidence-based research. This research can then inform policy decisions and guide their effective implementation. Working within existing mechanisms and reinvigorating institutions could be a way forward to build trust and dialogue among stakeholders and harmonise collaboration in the face of escalating climate vulnerabilities in South Asia.

4.1.1 RE-ENERGISING SAARC

SAARC is often considered the primary institution for regional cooperation in South Asia. However, it has been dormant with no official meetings since 2014. Differences in political ideology between India and Pakistan are believed to be the primary reason for SAARC's failure and a hurdle to greater regional cooperation. However, the onus is on all member states to move forward and push for better dialogue, especially in the area of climate change, which was recognised during the 2008 14th SAARC Summit in Dhaka when member states created an action plan on climate change with a goal towards regional cooperation (SAARC Action Plan on Climate Change, 2008b).

Regional cooperation on climate change through SAARC could be achieved through revitalising only the technical cooperation and aligning with other institutions, such as ISA or ICIMOD, where cutting edge research is conducted collaboratively. This could provide impetus and momentum to move forward the political process. SAARC can also facilitate the disbursement of climate finance and loss and damage negotiations, potentially modelled on the Southern African Development Community (SADC) model. While the primary objective of SADC has been infrastructure and economic integration, it also provides a space for countries that do not always have good relations to cooperate on aspects that are not contentious.

4.1.2 COLLECTIVE ACTION ON DATA COLLECTION

Data, particularly the lack of it or the withholding of it, is one of the most common reasons for disagreements or conflict between countries. However, when approached through existing mechanisms, it can be an area to build cooperation. We have already seen that the effects of climate change are regional, and joint action on data collection and sharing can be a powerful means to tackle future security risks. As most states in the region lack the institutions, infrastructure and investment needed to meet their data collection needs, a collaborative regional effort can yield substantial results. Climate negotiations at IPCC—and other fora—rest on national submissions of disaggregated data on actions taken to mitigate climate change and adapt to it, as well as details on emissions. It has been noted that developing countries may not have the capacity to meet the requirements presented by, for instance, the global stocktake at COP28. National governments can come together in South Asia to share expertise and best practices and provide training to meet these requirements.

Intra-region data sharing to prepare for the effects of climate change and current arrangements on data sharing can be improved and scaled up. There already exists some aspects of this within institutions such as ICIMOD, or between countries bilaterally on glacial melt. There is also considerable dialogue on joint infrastructure for energy development and in-land navigation, where a climate lens can be added. There is thus an opportunity here to further this engagement and look at early warning systems that will aid communities across borders, gather data on water resources such as physical and biological characteristics that are not considered a security threat, or jointly work on anticipatory adaptation measures that could alleviate considerable financial burdens.

While challenges persist in fostering regional cooperation within SAARC, it is crucial to revive the spirit of multilateralism and move beyond the current trend of unilateral implementation. Initiating a systemic

transformation and focusing on readily achievable measures such as strengthening preparedness, fortifying early warning systems, fostering community resilience, and establishing trust amongst South Asian countries to enhance emergency responsiveness are options for the way forward. The role of science in such a framework extends beyond merely informing policy to actively influencing and necessitating the development of cross-sectoral policies.

4.2 SUB-NATIONAL ADAPTATION MEASURES

Climate security will depend on the resilience of communities that face the brunt of direct impacts. South Asia has a long history of communities building resilience and accommodating to the changing cycles of monsoon, the primary driver of water and food security and economic development in the region. We need context-specific, decentralised approaches to adaptation, learning from this history of resilience, and expanding this capacity at the community level into other areas of climate security, be it heat that might affect agricultural output and health security, or destruction of infrastructure that could lead to migration and movement. By documenting best practices and fostering a system of cross-learning through existing institutions, these community-level solutions can become easier entry points to build upon and facilitate potential long-term climate cooperation.

Active involvement of women in community resilience initiatives is a key driver of change and must be integrated more visibly in the long-term resilience strategies at the community level. In Bangladesh for example, the Cyclone Preparedness Programme (CPP) has successfully trained nearly 40,000 women in disaster management, leading to a remarkable 100-fold reduction in cyclone-related fatalities (CPP, n.d.). Additionally, the programme has significantly reduced female fatalities by almost two-thirds compared to male fatalities. In India, the Swamini women's self-help group in coastal Maharashtra (Pillai, 2020) have been organising "mangrove safaris" since 2017, which take tourists through the Mandavi creek, introducing them to the rich biodiversity of the area and informing them on how to protect the region's mangroves. The initiative has gained recognition as a model for community-led conservation, and the State Forest Department has attempted to replicate it in other parts of coastal Maharashtra. These models and initiatives can be brought to similar ecosystems across South Asia.

Integrating indigenous knowledge with modern science through documentation of established best practices will provide much needed data on locally led adaptation methods that are community and gender responsive, and can be scaled up, or adopted in other regions. Sharing of community-level best practices within the region can become another avenue for cooperation, especially in border areas where conditions are largely similar on both sides—for example as seen between parts of Bihar in India and southern Nepal or between eastern India and Myanmar. Supporting locally led adaptation and strengthening social safety nets will empower communities to take action in areas affected by direct climate change impacts, such as on livelihoods, mass movement and migration. Pushing for experts, funding agencies, and governments to align with and support the initiatives driven by communities is often more cost effective than introducing new technologies and has a higher chance of self-sustaining in the long run.

There exist several successful cross-border community exchanges that could be built upon for greater regional cooperation:

1. Bhutan-India: Early warnings passed through community social media networks warn of possible flash floods, giving people time to move as needed (Ahmad, 2021).

2. Nepal-India: Community-led flood-related early warning systems alert downstream regions to cloud bursts and swollen rivers, helping around 64,000 people avoid potential devastation and death every year (Huang, 2023).

3. Border Haats at the India-Bangladesh border: Community-led local markets enabling trade amongst border communities are formally recognised by the two countries, also serving to strengthen economic ties (Border Haats, n.d.).

At the city level, there is tremendous potential for collaboration on challenges arising from rapid urbanisation that are being experienced across South Asia. Challenges such as increasing heat, flooding, air pollution, sea level rise, and population density are both natural and man-made. For example, communities shifting away from traditional architectural designs to more modern, multi-storey structures have drastic repercussions in seismically active zones (Devi et al., 2015). A UNESCO report details how buildings in the walled cities of Ahmedabad and Bhuj with timber lacing survived the 2001 earthquake, while other reinforced concrete structures did not. Such indigenous practices and knowledge can be shared across the region where land, weather and climate conditions might be similar. Many cities in South Asia have collaborated in global and regional city networks and developed climate action plans (Cities Archive - C40 Cities, n.d.) and resilience plans (CapaCITIES India, n.d.). For example, four cities in South Asia (Charles, 2023)—Narayanganj and Rajshahi in Bangladesh, along with Nagpur and Thane in India—collaborated with ICLEI South Asia and adopted the Urban-LEDS programme to develop their adaptation plans. We need more such networks and collaborative efforts for more effective climate mitigation and adaptation that leads to robust climate security. Collaboration on how to aid communities that will undoubtedly face loss of livelihoods due to transitions will be beneficial, as social conditions and systems are more similar across South Asia than with western counterparts.

4.3 BUILDING COOPERATION AND TRUST THROUGH DISASTER AND RISK REDUCTION MANAGEMENT

South Asian states now all have specialised teams that solely focus on humanitarian assistance and disaster relief (HADR). The constitution of these teams differs, as it is determined by a variety of factors including the typical nature of threats faced by a country, size, as well as the ministry under which the team is formed. For example, while in India disaster management is under the home ministry, in Sri Lanka it falls under the ministry of defence. These differences are both a boon and a bane, as they can lead to innovative approaches to disaster relief, but also create differences and a trust deficit between

nations. While countries do cooperate through joint exercises, sharing resources during disaster relief operations, sharing best practices, building capacities and training programmes, these actions are primarily on a bilateral and mini-lateral basis. Mechanisms that exist through the United Nations, such as the Regional Consultative Group (RCG) on Humanitarian Civil-Military Coordination for Asia and the Pacific, are not mandatory, and hence not all countries participate in a consistent manner. There is a need for greater knowledge sharing of existing best practices, as well as new mechanisms from the research and academic space within the region, that could potentially lead to creating regional standard operating procedures that can be of value during HADR operations. A collaborative effort can help overcome some of the challenges posed by limited resources and capacities, given the intra-regional diversities in South Asia. Recommendations towards achieving this include:

- Collaborating on scientific modelling tools, spatial data, and risk mapping techniques to analyse common climate risks and vulnerabilities.
- Establishing an inter-regional forum for HADR experts as part of South Asia's disaster governance (Cook & Chen, 2021).
- Exploring a South Asia Disaster Management and Emergency Relief Fund.
- Encouraging partnerships with sub-regional groupings like BIMSTEC, BBIN, and IORA, and fostering linkages between disaster management hubs.
- Facilitating inter-regional cooperation through academic exchanges. Exchanges and joint research could lead to improving the awareness and education on disaster management, enhancing availability and use of technology and minimising financial and other risks.
- Establishing a regional climate change centre to facilitate research, capacity building, and information sharing in the pursuit of sustainable solutions.
- Bringing regional think tanks, academic institutions, research organisations, and bureaucracies together to pool resources to study the challenges and vulnerabilities unique to the region and recommend sustainable solutions.
- Conducting detailed vulnerability and risk assessments of South Asian countries to help develop standardised disaster management approaches, as well as an array of situation-based solutions and protocols. These solutions should integrate gender-responsive planning strategies and community engagement and empowerment in a more intentional manner.

In operationalising these recommendations, a primary hurdle will be around sovereignty concerns. However, the unique nature and increasing frequency of climate-related distress ignores political boundaries. To achieve long-term security benefits, countries need to overcome current geopolitical challenges and mistrust and work towards reducing cascading risks of poor disaster management and

action. Regional collaboration will lead to faster and easier action than intervention and assistance from other regions, where social and religious contexts and norms also play an important role in delivering relief. Inspiration and understanding for such regional initiatives can be taken from the European Environment Agency, the Joint Research Centre or the African Risk Capacity under the African Union. The European Space Agency and European Environment Agency work together to collect, process, and distribute Earth observation data. They collaborate on initiatives like the European Climate Change Initiative and Copernicus Climate Change Service to provide spatial data, risk assessments, and climate change impact assessments across Europe. The spatial data is used to understand, monitor, mitigate and adapt to climate change. Another similar approach is the NASA and National Oceanic and Atmospheric Administration collaborating with various international partners to share satellite data and develop climate risk maps and models. These models provide a cross-learning opportunity that can be brought to and applied in South Asia.

4.4 ONE VOICE IN GLOBAL MULTILATERAL MECHANISMS

A regional bloc, even with intra-regional heterogeneity in development stages, can be of great help to smaller South Asian states that can then articulate their voices more forcefully. For example, South Asia, comprising of developing countries at different stages of growth, has a predicament when it comes to international climate cooperation, as often the rules laid down by developed nations can be unrealistic given the challenges faced. While countries have been voicing concerns individually at different fora, coming together will strengthen the region's opportunity to voice shared concerns at platforms like the UNFCCC. For example, as the world moves away from fossil fuel-based economies to greener sources of energy, South Asia is also faced with aiding communities that will undoubtedly face loss of livelihoods due to energy transitions. In the creation of these 'just transitions', there is opportunity for regional cooperation. Such a bloc can overcome the challenges of limited resources and institutional capacities.

One approach is to build upon the initiatives and leadership demonstrated by South Asian countries within the UNFCCC framework in a coordinated fashion.

Examples of such attempts:

- Bangladesh, while serving as the Chair of the Climate Vulnerability Forum (CVF) from 2020 to 2022 (Ministry of Environment, Forest & Climate Change Government of the People's Republic of Bangladesh, 2023), advocated for the establishment of a Delivery Plan outlining the agreed-upon USD500 billion climate finance commitment from developed countries for the period 2020–2024.

- India at COP15 coordinated with similarly placed developing countries Brazil, South Africa and China to form the BASIC alliance to counter the pressure from other stronger blocs, partly western led and negative US-China dynamics.

- At COP20, India was a core member of the Like-Minded Developing Countries alliance that pushed back against the undifferentiated commitments agenda of the developed countries (Sengupta, 2019).

- During the 2022–2023 G20 Presidency term, India advocated for a Global South agenda that integrated climate change considerations such as promoting "low-GHG/low-carbon emissions, climate-resilient and environmentally sustainable development pathways" and encouraging "actions to address development and climate challenges, promote Lifestyle for Environment (LiFE), and conserve biodiversity, forests and oceans" (G20 New Delhi Leaders' Declaration, 2023).

- Pakistan, as the Chair of the Group of 77, along with China, played a pivotal role during COP 27 by rallying support for the establishment of the Loss and Damage Fund. They achieved this by formally introducing the fund to the conference agenda and subsequently advocating for a consensus agreement. This effort took place against the backdrop of devastating floods that affected one-third of the country in 2021. In 2023, three of India's Himalayan states faced similar catastrophic floods. Given that the region collectively confronts the impacts of climate change, and is dependent on the same monsoon patterns, shared rivers, and glaciers, it is crucial to label each hazard in the region as a South Asian tragedy. Adopting a unified approach in implementing and operationalising the fund will not only strengthen regional cooperation but also reinforce South Asia's identity as one of the most vulnerable regions, with immense potential to determine global climate leadership.

There are several areas where negotiating as a bloc will be beneficial to countries in South Asia. All nations have set NDCs and have also updated them—it is imperative that they receive financial and technological assistance from developed countries as well as each other where feasible. It is crucial to continue advocating for commitments from developed nations. A unified regional stance, either at COP or other similar fora, can advocate for fast-tracking action, transforming climate finance through grant-based financing, ensuring inclusivity and the role of people and nature in climate action, and funds for loss and damage, grounded in the principles of climate justice and the recognition of common but differentiated responsibilities. By collectively pushing and adhering to these principles, South Asia can carve out a distinct and evolving role as a multilateral grouping. This will not only be beneficial to the countries in the region but also for other regions and states that are likely to grapple with similar challenges in the years ahead. Ultimately, what works in South Asia will have positive global ramifications.

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