Ecological Cooperation in South Asia: The Way Forward

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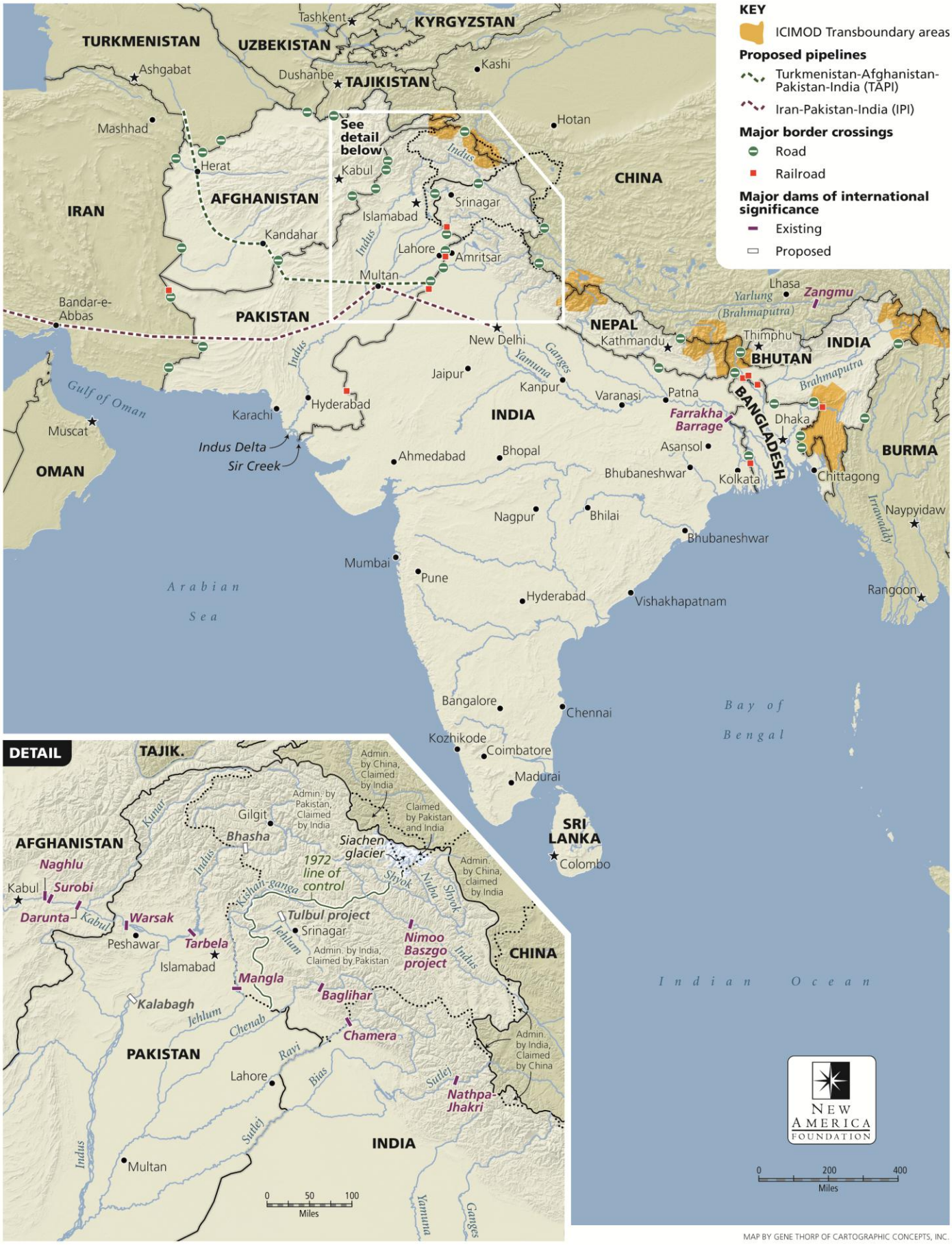
The greatest loss of human life and economic damage suffered by South Asia since 2001 has not been due to terrorism and its ensuing conflicts, but rather due to natural disasters ranging from the 2005 Kashmir earthquake and the Indus floods of 2010 to seasonal water shortages and drought. Although such calamities themselves might not be preventable, their human impact can certainly be mitigated.

Executive Summary

This report argues that such mitigation of environmental stresses is possible only through regional approaches to ecological cooperation. Furthermore, the ecological cooperation from such regionalism has the potential for building trust to resolve long-standing territorial disputes, especially between India and Pakistan. Raising ecological factors from a technocratic matter to one of high politics will require leaders to reconsider the role of existing regional organizations, most notably the South Asian Association for Regional Cooperation (SAARC), as well as scientific organizations such as the International Centre for Integrated Mountain Development (ICIMOD). SAARC's charter, for example, prevents India and Pakistan from linking technical regional cooperation to broader territorial disputes that are deemed to be bilateral matters. However, bilateral agreements such as the Indus Waters Treaty between India and Pakistan are also confined by their highly specific terms of reference. The treaty has been tested with numerous ongoing disputes between the two countries on water management projects, but it was never intended to be an ecological management agreement; rather, it divided up the rivers based on water flow metrics. Instead of renegotiating an agreement that is structurally focused on dividing natural resources rather than finding environmentally efficient solutions, it would be more productive to consider new cooperative mechanisms regarding conservation and improving the quality of the watershed.

International environmental treaties, such as the Ramsar Convention on Wetlands protection, which have transboundary cooperation within their mandates, can also provide a mechanism for linking ecological cooperation to broader resolution of disputes and enhanced regional security. If with technology nations can find more efficient means of water and energy utilization across South Asia, the pressures on distributive aspects of water and energy scarcity can also be reduced, thus lessening the chance for conflicts over these resources.



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The most consequential ecological features in South Asia are the Himalayas and the rivers that are largely derived from their geography. Some of the worst territorial disputes in the region also span these mountains. Hence, scientific and socio-cultural research on mountain ecosystems is likely to play a pivotal role in galvanizing regional cooperation and reaping peace dividends.

International development donors need to configure existing programs to incentivize projects that build trust and have the potential for subsequent peace-building. For example, cooperation on glacial scientific research or estuarine ecology could be constructively linked to resolution prospects for the Siachen and Sir Creek disputes. Some of the notable programs with potential for such reconfiguration include the Climate and Development Knowledge Network (CDKN), the South Asian Network for Development and Environmental Economics (SANDEE), the South Asia Regional Initiative for Energy (SARI/Energy), and the South Asian Co-operative Environment Programme (SACEP). Yet, the current approach of donors, as exemplified by efforts such as ICIMOD's program covering seven transboundary corridors (none of which include both India and Pakistan), tends to focus on the low-hanging fruit rather than initiatives that could provide a more lasting impact on regional peace. Connecting environmental factors with basic human necessities such as food and healthcare can also raise the political prominence of these approaches. Recent concerns about communicable diseases such as dengue and polio can provide impetus for regional cooperation that has broader peace-building goals.

Trade can also be more appropriately configured to consider environmental factors as a cooperative mechanism. For example, goods for which one country has a comparative advantage in terms of climate or water availability could be targeted for trade priority. Thus trade should focus on importing products whose energy or water inputs are more efficiently obtained elsewhere rather than trying to build massive new domestic infrastructure for water or energy. At the same time, trade in energy itself, through efforts such as gas pipelines or technology transfer for renewable energy infrastructure, should be encouraged, as the huge rise in resource consumption projected for South Asia will require supply-side as well as demand-side cooperative strategies.

This report concludes with six key policy recommendations derived from the analyses conducted:

a) *Salience of SAARC:* Despite its poor performance historically, SAARC has regional legitimacy and a professional base that should be cultivated and empowered to implement environmental diplomacy and regional peace-building.
b) *Beyond the Indus Waters Treaty:* Having served an important purpose of preventing riparian conflict, the treaty should maintain this role with additional regional technology transfer and integrated water management initiatives to reduce inefficiencies.
c) *Mountains Matter:* Cooperative programs by international donors should strengthen their focus on mountain ecosystems, given their prominent environmental vulnerability as well as their importance in defining territorial borders.
d) *Invoking Environmental Treaties:* South Asian countries have ratified several notable environmental treaties with regional cooperation as part of their mandates, which treaty secretariats should invoke as part of the countries' obligations.
e) *Broadening Knowledge Networks:* Scientific cooperation through academic institutions should be given priority in visa regulations and development assistance with the goal of establishing regional knowledge networks that enhance the capacity for joint environmental research.
f) *Crisis Communication:* Proactive rather than reactive strategies for building regional resilience against natural disasters should be enhanced in the

areas of environmental health, building on the success of flood-monitoring programs.

In summary, this report finds that a gradual shift from bilateralism to multilateralism is essential for the ecologically sustainable development of South Asia. Such a shift should be instrumentally used for peace-building and is an underutilized diplomatic tool that has much potential for achieving broader international security objectives in the region.

Introduction

South Asia is home to a quarter of the world's population, inhabiting some of the planet's most diverse ecological systems, from the highest mountain range (the Himalayas) to the largest riparian delta system (the Ganges-Brahmaputra). By 2050, South Asia's population will exceed 2.2 billion, with an estimated 600 million people living on less than $1.25 a day. About 70 percent of South Asians live in rural areas, representing 75 percent of those at the lowest income levels.[i] Given this population distribution and the relatively rapid change in the environmental profile of South Asia, the human vulnerability to even minor environmental stresses and consequential conflict and civil strife is very high. The purpose of this study is to explore ways by which the narrative in South Asia might be shifted from conflict to cooperation using ecological factors as a binding mechanism. The study was carried out through a detailed and systematic review of national statements, conflict narratives in news stories and speeches of leaders, statements by regional organizations, and select interviews with stakeholders to gain clarification and context on particular events.

Greening Existing Regional Organizations: Beyond Historical Inertia

Regional cooperation in South Asia is a relatively recent phenomenon. While East Asia was busy working on visa-free trade zones through organizations such as ASEAN, much of South Asia was embroiled in conflicts. As with other parts of the world, the Cold War created a polarization that prevented regional cooperation. India, the dominant power, was focused instead on developing the Non-Aligned Movement as an antidote to Cold War allegiances. It was not until 1980 that the idea of establishing a separate organization focused on South Asian cooperation was moved forward. The preconditions for establishing the South Asian Association for Regional Cooperation (SAARC) were quite confining in terms of what could be achieved but similar to those of several other organizations for regional cooperation conceived at the time. Five key principles define all SAARC activities:[ii]

- Respect for sovereignty, territorial integrity, political equality and independence of all member states
- Non-interference in the internal matters is one of its objectives
- Cooperation for mutual benefit
- All decisions to be taken unanimously and need a quorum of all eight members
- All bilateral issues to be kept aside and only multilateral (involving many countries) issues to be discussed without being prejudiced by bilateral issues

SAARC was formally established as a permanent organization in 1985, with a secretariat hosted in Kathmandu, Nepal. Its seven original members—Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka—agreed to admit Afghanistan as an eighth member in 2007.[iii] The addition was particularly significant because SAARC could thereby act as a forum for India and Pakistan to negotiate their strategic influence over Afghanistan's development path. In Pakistan, there has been recurring suspicion about ulterior motives for India's high level of development aid to Afghanistan. Allowing for a transparent exchange on regional development investment in Afghanistan could be an effective means of assuaging some of this mistrust. At the same time, there has been movement by Pakistan and India to establish their

own spheres of influence, heading west and east respectively for regional partners.

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) was formed partly as a response to the perceived inefficacy of SAARC due to repeated deadlocks between India and Pakistan. The BIMSTEC agreement also includes Myanmar and Thailand, with which India has strong trade ties. Energy and some environmental areas of cooperation, such as fisheries, are proposed subjects of activity, in addition to a broader trade and infrastructure cooperation agenda. However, there is still modest progress on ecological cooperation, although the Asian Development Bank has engaged with BIMSTEC to support infrastructure linkages, particularly in the transport sector, whereby environmental planning criteria may be more directly incorporated.

On the western frontier, the Economic Cooperation Organization (ECO) has a specific directorate pertaining to minerals, energy, and environment. This organization was established in the same year as SAARC (1985) by Iran, Pakistan, and Turkey with the goals of promoting economic, cultural, and technical cooperation. With the dissolution of the Soviet Union, several Central Asian states joined ECO, and the organization now comprises 10 member states. All members are Muslim majority states and six of the 10 are landlocked. ECO is a forum for Afghanistan and Pakistan to have more direct communication facilitated by Central Asian partners and is considered a counterweight to the dominance of India in communications within SAARC. However, Iran's involvement in the organization and the fact that its secretariat is based in Tehran make it difficult to gain much interest from international donors despite some important proposed initiatives related to regional ecotourism and energy infrastructure collaboration.[iv]

One possible connection that could be made between ECO and SAARC was suggested by then Pakistani Prime Minister Yousuf Raza Gillani at the SAARC summit in 2011 and involved the road link between Tajikistan and Pakistan to connect South Asian markets to SAARC countries.[v] This broader vision would also tie in with the "New Silk Road" initiative that U.S. Secretary of State Hillary Clinton announced at a regional meeting in Chennai in 2011. The goals of the Silk Road vision were elaborated by State Department official Geoffrey Pyatt in an official policy speech at a conference in Tokyo in June 2012, in which he noted that in addition to the expansion of merchandise flow, the vision involves cooperation "through energy, water, transport, and infrastructure—which includes roads, bridges, electrical transmission grids, railways and pipelines—***to connect*** goods, services, and people."[vi]
However, to make such a Silk Road work better and with far greater consequence, these initiatives will inevitably need the assistance of China, which has established its own regional grouping that overlaps with the Central Asian members of ECO. The Shanghai Cooperation Organization (SCO), established as a means of strengthening China's partnership with Russia in the region, also has environmental and energy cooperation dimensions that could have a bearing on South Asian regional cooperation.[vii] Among SAARC countries, India, Pakistan, and Afghanistan join Iran and Mongolia as "observers" within the SCO. Pakistan has been actively lobbying for full SCO membership, and in November 2011 the Russian government indicated it would officially support Pakistan's full membership despite concerns from India. SCO has the potential of becoming a much more consequential partner in areas of energy and transport cooperation as the northern Asian states seek access to the lucrative high demographic growth markets of South Asia.

Despite the growth of these regional organizations, the potential for SAARC to play a role in multilateral ecological cooperation remains strongest. Within the ecological arena, SAARC has a program of work on environment and energy that includes the aims of establishing a specific Convention on Environmental Cooperation, which was reaffirmed in the Thimphu Declaration on Climate Change (2010). Among the lesser-known accomplishments of SAARC is

the establishment of the South Asian University in New Delhi[viii], where students from all member countries study together under one institutional umbrella. The university held its first classes in 2010, just five years after the idea was introduced at the SAARC summit in Dhaka, initially offering master's degree programs in computer applications and development economics. At the 2011 SAARC summit, Indian Prime Minister Manmohan Singh announced that India would increase the number of SAARC Silver Jubilee Scholarships at the university from 50 to 100 (75 at the master's level and 25 at the doctoral level).

The persistent acrimony and nuclear rivalry between India and Pakistan have often hampered substantive progress on regional cooperation. Yet SAARC is evolving into a forum that links civil society and governments in the region through common denominators such as education, the environment, and human rights. At the 2011 summit, "Peoples' SAARC,"[ix] a parallel initiative to the official SAARC established in 1996 as a means of providing policy evaluation to local governments, provided a "memorandum" with detailed practical "demands" concerning the rights of fishermen in regional waters, migratory populations, and communities affected by climatic changes and disasters.

In his formal remarks at the SAARC summit in 2011, the Indian prime minister also stated unequivocally that "India has a special responsibility that flows from the geography of our region and the state of our economy and market."[x] Environmental cooperation was highlighted specifically in the context of the India Endowment for Climate Change, which will provide 10 scholarships per year to citizens of SAARC member states for post-graduate and doctoral studies in forestry courses at the Forest Research Institute in Dehradun, India. The recognition that mountain ecology can be a binding educational mechanism is reflected by the choice of venue for this program.

Himalayan Harmony: Why Mountains Have Been a Focus for Environmental Cooperation

Going back to 1991, when the South Asian Association for Regional Cooperation (SAARC) launched a *Regional Study on the Causes and Consequences of Natural Disasters and the Protection and Preservation of the Environment*, there has been a recognition that regional environmental cooperation is linked to the Himalayas—the world's highest mountain range, which defines the region's geography. As noted in the report at the time, "Pakistan, India, Nepal, and Bhutan share amongst themselves the vast Himalayan mountain range and Bangladesh's ecological situation is such that it is greatly influenced by ecological changes in the Himalaya. These mountains are today one of the most densely populated in the world and face severe human-made environmental problems together with natural hazards inherent in local ecological conditions."[xi] From an economic development perspective, the importance of linking climate change and leveraging the commonality of the Himalayas has also been noted by the Asian Development Bank in a commissioned paper on the *Political Economy of Regional Cooperation in South Asia*.[xii]

Mountains have been considered natural borders and zones of separation. They often form physical barriers between human settlements and have thus defined cultural identities and formed political borders. Yet, environmental factors have led erstwhile adversaries across the cultural and political divide to consider ways of cooperating around mountain systems. This is due to the seminal role mountains play in providing resources for human survival—most notably their role in regulating climatic conditions through altitudinal variation.

Atmospheric water resources are brought to land most often through mountain systems. The hydrological fortune of countries and communities is thus often defined by which side of a mountain range they lie, and which crops they can cultivate. The "rain shadow," which has often determined the sparseness of populations, particularly in central and southern Asia, is determined almost entirely by

the geography of mountain systems. The Himalayas traverse the most populated parts of the world, encompassing almost half of the world's population. Yet these mountains also define some of the most intractable territorial disputes in the region, particularly between India and Pakistan but also between India and China.

Interestingly, cooperation on environmental matters in the region predates the establishment of SAARC in 1985. The unique characteristics of the Himalayan region, featuring the world's highest mountain range with the steepest elevation gradient, prompted the creation of the International Centre for Integrated Mountain Development (ICIMOD), which has its roots in the UNESCO "Man and the Biosphere" program, launched in 1983. The government of Nepal offered to host the new institution, and the governments of Switzerland and Germany, along with UNESCO, agreed to act as the founding sponsors. Nepal and UNESCO signed the formal agreement and inaugurated ICIMOD in December 1983 with its headquarters in Kathmandu, legitimized through an act of Parliament in Nepal the same year.

The center has the formal mandate "to enable and facilitate the equitable and sustainable wellbeing of the people of the Hindu Kush Himalayas by supporting sustainable mountain development through active regional cooperation."[xiii] ICIMOD is governed by a Board of Governors comprising one representative from each of the regional member countries and independent members who are nominated by the ICIMOD Support Group based on their recognized professional expertise and experience. One of the regional cooperation initiatives of ICIMOD has been the establishment of a Himalayan University Consortium for Mountain Development Studies (HUC), which has the stated goals:

To promote and support the conducting, acquiring, preserving, and sharing of mountain research, and to develop data, information, and knowledge through academic and non- academic means and platforms;

To provide open and equitable access to these knowledge resources to members and possibly others in the region;

To promote the effective use of the available knowledge through training courses, academic curricula, student/faculty exchanges, and web- based information portals.

Since 2002, ICIMOD has made a concerted effort to undertake seven transboundary conservation initiatives in the Himalayas that are also connected to the aforementioned educational programs. Among the most prominent has been the Kailash Sacred Landscape Conservation Initiative (KSLCI), a "regional collaborative programme to promote transboundary cooperation for biodiversity conservation and sustainable development in the greater Kailash region of China, India, and Nepal."[xiv] On the western frontier, ICIMOD has launched the Karakoram-Pamir and Wakhan Corridor initiatives, which focus on transboundary cooperation among China, Pakistan, and Afghanistan. The Sino-Pak border region in the Karakoram area hosts two national parks, the Khunjerab National Park (established in 1974) on Pakistan's side and the Taxkorgan Nature Reserve (established in 1984) on China's side. However, there has been a reluctance to connect India and Pakistan within the same initiative, despite the importance of regional connectivity in the Kashmir region. In a recent report on the Karakoram-Pamir initiative, the following statement highlighted the pragmatic decision by ICIMOD to steer clear of any direct Indo-Pak ecosystem management approach, despite numerous proposals submitted based on ecological grounds:

"Several mechanisms have been suggested to implement the joint conservation action such as: establishment of a Biosphere Reserve, covering Karakoram in all the three host countries of Pakistan, China and India; establishment of a Biosphere Reserve, covering the Pakistani Karakoram and Chinese Pamir under the 'Man and Biosphere Reserve' scheme; establishment of a Peace Park, covering the Pamirs of Afghanistan, Tajikistan, China and Pakistan (idea

by Wildlife Conservation Society); establishment of a Peace Park, covering Taxkorgan Nature Reserve, Khunjerab National Park and Central Karakoram National Park; establishment of a transboundary park, covering Taxkorgan Nature Reserve and Khunjerab National Park, etc. However, there is a need to quickly define a realistic action plan with milestones and timelines to formalize and strengthen the regional landscape initiative in the KPL."[xv]

The fact that none of the seven transboundary initiatives have both India and Pakistan collectively cooperating suggests the limits of using environmental peace-building as an approach for cooperation in the region.

Part of the challenge for organizations such as ICIMOD remains their dependence on foreign donors. These donors are beholden to political decisions from their governments and are reluctant to approach Indo-Pak collaborative efforts. The fact that none of the seven transboundary initiatives have both India and Pakistan collectively cooperating suggests the limits of ICIMOD in using environmental peace-building as an approach for cooperation in the region. Nevertheless, the Kailash initiative does include India and China, which have been historical rivals in the Himalayan region, particularly because of the thorny issue of Tibet. There is a broader organizational goal, that if progress is made on the Sino-Indian collaboration effort, there could be a role for Chinese scientists to play in extending such cooperation between India and Pakistan, since China shares borders with both countries in the most sensitive parts of the territorially disputed regions.[xvi] These are also the same areas where the threat of climate change continues to be most acute and where the data on glacial change are often contested in the academic literature.[xvii]

The most direct willingness to support the engagement of Indian and Pakistani scientists on cooperative research has come from the United States. With the support of the U.S. National Science Foundation, ICIMOD hosted a workshop for Indian and Pakistani glaciologists in 2007 to foster cooperative scientific research. This effort also tied in with the recurring calls for using environmental peace-building in resolving the Siachen dispute. However, no progress has occurred thus far on this front despite renewed impetus for such an undertaking after the tragic avalanche that killed more than 100 Pakistani soldiers and civilians in Siachen in April 2012.[xviii]

Visa access for Indian and Pakistani scientists is far more difficult to obtain in comparison with art and cultural exchanges. There is still a perceived threat from scientific cooperation due to concerns about scientists getting access to sensitive security information. Even though environmental scientists focus on planetary processes rather than particular mechanical details of military devices, they are perceived to have the potential skills to transfer such sensitive information. Scientists have repeatedly been prevented access by both countries for collaborative meetings in this regard despite various cultural exchange visa programs.[xix]

Perhaps the closest that Indian and Pakistani scientists have come to a concerted collaboration has been through the South Asian Network for Development and Environmental Economics (SANDEE), which was established in 1999 under the auspices of the International Union for Conservation of Nature (IUCN) and subsequently hosted at the ICIMOD secretariat. The mission of SANDEE is to "use economic tools and analyses to address South Asia's environmental challenges. It is based on the premise that solutions to economic development concerns and environmental problems are integrally linked."[xx] The network has been well-resourced through grants from the World Bank, the Canadian government's International Development Research Centre (IDRC), the Norwegian Agency for Development Cooperation (NORAD), and the Swedish International Development Cooperation Agency (SIDA). A regular

collaborative research grant program as well as numerous training programs across the region have been sponsored.

SANDEE's competitive grants program in 2011 generated 15 new projects out of a possible 99 pre-proposals. The grants spanned a variety of issues—biodiversity conservation, pollution effects, sustainable agriculture, water conservation, policy analyses—with a third of them focused on climate change. SANDEE launched three cross-country studies on climate and migration in Bangladesh, India, and Pakistan in which it sought to understand the extent to which the movement of people is induced by the effects of weather on agriculture. This work is aimed at complementing ongoing studies about the burning of agricultural field residue in Bangladesh, India, Nepal, and Pakistan.[xxi]

Collaborative research among scholars across national divides still remains elusive. Leadership from international organizations will be needed in directly focusing on Indo-Pak cooperative research, rather than simply couching the matter in regional cooperation terms, to have tangible impact on using such efforts as confidence-building mechanisms or citizen diplomacy.

Drawing Lessons: National to Regional and International Approaches

As the largest country in South Asia, India is perceived by its neighbors to assume a particular responsibility for action on regional ecological concerns. In 2008, Indian Prime Minister Manmohan Singh announced that India would pursue eight national "missions" for sustainable development: solar energy, energy efficiency, creating a sustainable habitat, conserving water, preserving the Himalayan ecosystem, creating a green India, creating sustainable agriculture, and, finally, establishing what he called a "strategic knowledge platform for climate change." In announcing these missions, Singh noted that India traditionally has treated nature "as a source of nurture and not as a dark force to be conquered and harnessed to human endeavor. There is a high value placed in our culture to the concept of living in harmony with nature."[xxii] Yet the promise of this plan was tempered by domestic concerns regarding the pace of development, and a few months after the launch of the national missions, the external affairs minister noted that "political compulsions force us to meet the aspirations of our people quickly even as we subject ourselves to newer and more rigid international standards and norms."[xxiii]

Within this national platform, however, the area where regional cooperation should be further explored is in the mission for a "strategic knowledge platform for climate change." In addition, there is the Climate and Development Knowledge Network (CDKN), which was established under the Copenhagen Climate Change Summit in 2009. The regional South Asian hub of this network is based at a Pakistani NGO called Leadership in Environment and Development (LEAD-Pakistan).[xxiv] India's Energy and Resources Institute (TERI) and LEAD-Pakistan are cohosting the first joint deliberative program of the two countries' planning commissions in 2013. Donor support should be encouraged to ensure the continuity of such joint planning exercises that consider ecological factors.[xxv]

Environmental cooperation between Afghanistan and Pakistan could also play a role in more regional stability. For example, data-sharing and technical cooperation could eventually pave the way toward a bilateral Afghan-Pakistani water resources commission and perhaps even a treaty governing the Kabul River's resources. Pakistan sent a technical committee to Afghanistan in 2003, and the World Bank in 2006 offered support for joint consultations. Yet distrust between Afghanistan and Pakistan have hampered such initiatives, though some tentative efforts continue.[xxvi]

The lack of an international agreement on water continues to be a concern for using a treaty-based approach to regional "hydrodiplomacy." Five environmental treaties that were promulgated by the U.N. Economic Commission for Europe could provide important models for South Asia as well. These five treaties are:

Convention on Long-range Transboundary Air Pollution

Convention on Environmental Impact Assessment in a Transboundary Context

Convention on the Protection and Use of Transboundary Watercourses and International Lakes

Convention on the Transboundary Effects of Industrial Accidents

Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

Interestingly enough, the definition of "Europe" in this context extends as far as Tajikistan, which borders the Pamir region and Wakhan. It would be worthwhile to explore the extension of these agreements or their applicability to South Asia through the United Nations system. Extending this framework to South Asia is particularly significant, given the rise in extreme weather events and disaster response cooperation in this region.

The closest South Asia has come to such a system was when the World Meteorological Organization (WMO) and partner countries, alongside ICIMOD, developed a disaster mitigation project titled the Hindu Kush-Himalaya Hydrological Cycle Observation System (HKH-HYCOS). The stated aim of this project is to "enhance regional cooperation in hydrometeorological data collection and sharing for flood forecasting to support disaster prevention and flood management at the regional level."[xxvii] The project has established a regional flood information system (RFIS) to facilitate transboundary exchange of real and near-real-time data, best practices, and know-how in support of flood management. It also seeks to build the technical capacity of the national hydrological and meteorological services of partner countries. The overall objective is to mitigate casualties and property damage through timely exchange of flood data and information between and among partner countries.

The project was initiated in May 2001 with the financial support of the U.S. State Department (Regional Environmental Office for South Asia) and the U.S. Agency for International Development (USAID) Office for Foreign Disaster Assistance (OFDA), based on the proven concept of WMO's World Hydrological Cycle Observing System

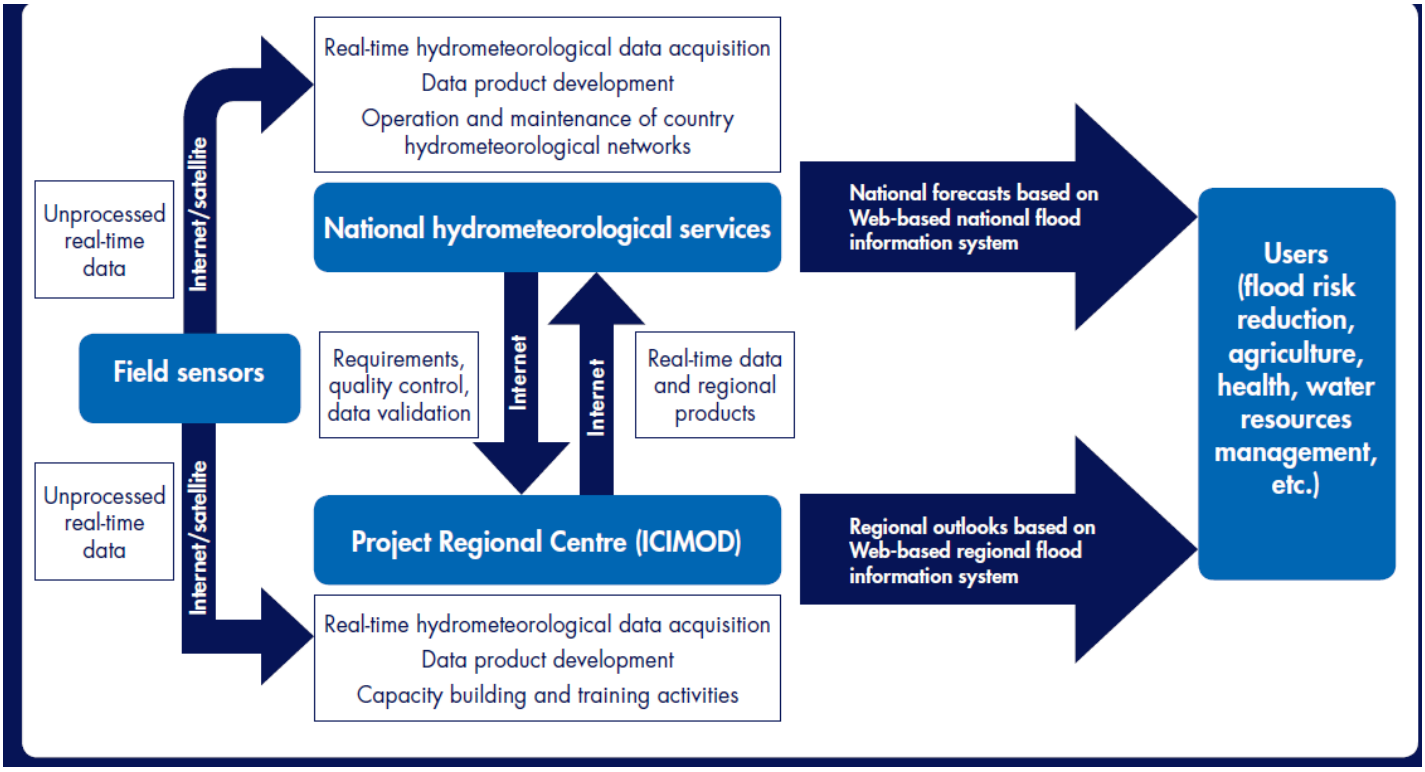

Figure 1. Regional Cooperation on Flood Control in South Asia (see citation xxviii)

(WHYCOS). Technical experts and government representatives from partner countries were invited to the first phase in a deliberative process. The current phase, which started in December 2009, is supported by the Finnish government's Ministry of Foreign Affairs (See Figure 1).[xxviii]

Engineering Diplomacy: From Technocratic Cooperation to Jointly Efficient Resource Usage

Much as the Indus Waters Treaty is celebrated in terms of preventative "hydrodiplomacy," the treaty employed a rather linear process of dividing up the major tributaries of the Indus between India and Pakistan and providing some risk assurance through the construction of dams. Ecological factors in terms of arability impact on land and biodiversity were not on the horizon of negotiators in 1960, when the treaty was finalized. It was thus not meant to be a truly "cooperative" agreement but rather a symptomatic response to prevent further escalation of conflict.[xxix]

Clearly there are some distributional aspects of water-sharing between India and Pakistan that are inherently a "zero-sum game." In such cases there is little prospect for trying to use ecological factors as a means of improving trust. The dispute resolution procedures within the treaty should be continued and perhaps refined to cope with such challenges. The Baglihar Dam dispute resolution of 2007, which involved Pakistan's challenge of an impoundment on the Chenab River, exemplifies the scope and limitations of the Indus Waters mechanism. The arbitrator resolved the dispute in 2010 with allowance for gated spillways for India and a reduction in the height of the proposed dam to satisfy Pakistan's concerns, purely on engineering feasibility criteria that met the water distribution mandate of the treaty, rather than broader watershed sustainability considerations.

The ongoing Kishanganga arbitration and the latest riparian dispute over the Tulbul / Wullar navigation project are likely to follow a similarly limited scope of solutions, confined to the parameters of the project rather than considering regional planning solutions. The Tulbul case also opens up the issue of tourism development, which could be a cross-border cooperative activity if appropriately configured. In this case, India is planning the controlled release of water during the drier months of October to February to facilitate navigation for trade and tourism, but will most likely require arbitration because a broader regional benefits framework has not been presented.[xxx] India maintains that the regulating structure is permitted under the Indus Waters Treaty for the non-consumptive use of navigation and that no "pondage" of water was being created over the Jhelum River. Pakistan, however, contends that this is a "storage project" and will deprive Pakistan of its rights under the treaty. With growing scarcity of water due to climatic changes as well as demographic pressures, such disputes are likely to escalate. The treaty does not have a cooperative mechanism predicated on ecological premises and in some instances has resolution mechanisms that are inherently non-adaptive to environmental change.

For example, the allocation of the Chenab and Jhelum rivers to Pakistan still provides for a fixed "top-up" of water for India from these rivers every year that is approximately enough to irrigate 320,000 hectares of cropland.[xxxi] Another recent dispute that highlights the limitations of the treaty involves the use of hydroelectric dam construction to claim carbon credits. India managed to secure carbon credits for the Nimoo-Bazgo project, which has been contested by Pakistan since 2002; Pakistan also claims India did not respond until December 2006. The hydroelectric project, with a capacity of 45 megawatts, has been built near Alchi village in India's Leh district. As this dispute shows, although climate change could be a catalyst for cooperation in terms of collective planning for extreme weather events, it can also create incentives for new infrastructure projects that push the limits of the current riparian sharing arrangements.[xxxii]

While there is little doubt that the Indus Waters Treaty was not structurally designed to deal with climate change uncertainties, views differ on whether renegotiating the

treaty is the proper path to preventing conflict over water. Michael Kugelman of the Woodrow Wilson Center in Washington, D.C., has argued that "the best hope for averting water war lies not in repairing frayed political ties or enhancing water diplomacy, but rather in better managing domestic water resources."[xxxiii] He contends that infrastructure that was the outgrowth of the treaty was not efficiently designed and that domestic policies have not been adequately maintained or adapted to cope with climatic and demographic stresses. Thus water conservation technologies and the repair of leaky pipes and canals, as well as cooperative frameworks, could be a more assured path to conflict mitigation than a renegotiation of the treaty itself. Sharing science and engineering expertise to enhance such conservation strategies could still be a cooperative mechanism between India and Pakistan, and indeed other regional partners. Such cooperation could be more easily framed within the mandate of SAARC rather than trying to renegotiate the treaty, which is excluded from the SAARC charter's mandate.

Just as water is being lost through bad infrastructure, energy losses due to inefficient power lines is an immense challenge in the region. Much of the impetus for developing water infrastructure in the region comes from the growing need for power in South Asia. The rapid rise of population and the pressures for industrialization are leading to an unprecedented demand for energy. Thus water infrastructure policy will need to be tied to decision-making on multiple sources of energy. Such connections are, however, very tenuously made. For example, while developing large dam infrastructure primarily for power (as stated by India in the construction of numerous "run-of-the river" projects) has led to further conflict, the development of natural gas pipelines has the potential for a more cooperative infrastructure outcome if managed with appropriate measures.[xxxiv] The Energy Charter[xxxv], which has thus far been limited in its efficacy, could be used to strengthen a proposed protocol on transboundary pipelines.[xxxvi] Natural gas is an important transition fuel and more versatile than hydropower, as it can be used for mobile transport and as a direct fuel for heating and cooking (thus making it more efficient in most uses).

In addition, renewable energy sources in terms of small-scale hydropower, solar, and wind should still be given importance for rural electrification despite their limitations in meeting large-scale demand. Networks such as the USAID-funded South Asia Regional Initiative for Energy (SARI/Energy) are important efforts in this regard. The mandate of SARI/Energy is to "promote technical and institutional frameworks for regional energy planning and infrastructure investment involving cross-border trade in energy."[xxxvii] This is a bold effort with the potential for considerable impact in fostering broader linkages between water and power. However, here too USAID has been limited in its ability to more directly encourage Indo-Pak cooperation, given the lack of political will on the part of the U.S. administration to make such leveraging a priority.

Such cooperative efforts are likely to succeed only if there is recognition among the countries of the region that river systems and energy sources have fundamental ecological underpinnings and are not defined by political or ethno-religious boundaries.

An interesting development in riparian cooperation was the establishment in 2000 of the Mekong-Ganga Cooperation (MGC) initiative during a ministerial meeting of six member countries: India, Thailand, Myanmar, Cambodia, Laos, and Vietnam. The countries emphasized four areas of cooperation between the river basins—tourism, culture, education, and transportation linkage—as a solid foundation for future trade and investment cooperation in the region. The MGC initiative uses a riparian frame to focus on cultural cooperation among countries believed to have been influenced by Indic culture. The organization's exclusion of Bangladesh, which has much of the Ganges delta within its borders, shows that the initiative did not have ecological origins, despite using rivers as the locus of inclusion. However, following the sixth ministerial meeting of the MGC in New Delhi in September 2012, the

Bangladeshi prime minister raised the issue of the country's exclusion during conversations with the Vietnamese leadership.[xxxviii]

River systems and their potential for energy and cultural connectivity are also inextricably tied to the region's agrarian economic roots. Cooperation on land use for food crops and their linkage to human security deserves fare greater attention as well.

Food Security: Greening Trade for Regional Cooperation and Resource Conservation

Ultimately the need for water resources is rooted in food consumption, since over 70 percent of the world's water usage is related to agriculture. Although some progress has been made with population control in South Asia, there is still a huge population rise expected, particularly in Pakistan, and the "demographic dividend" can be captured only if the population is kept out of starvation, is educated, and is able to be productive. With increasingly limited opportunities for migration to the developed world and diminishing remittances from abroad, South Asians will be constrained to find food and livelihoods within their national boundaries. Reconfiguring food security in South Asia is an imperative due to the region's varied demographic trends and an inability to reach broader consensus on the sensitive issue of population control.

Food security, water diplomacy, and trade can also be brought together by operationalizing the concept of "virtual water," a term used to indicate that all commodities require certain amounts of water, which is then indirectly (or virtually) traded. When dealing with water scarcity, it is more suitable to trade products from areas where water is most efficiently utilized in production than to build elaborate water transfer systems. For example, if water is more efficiently used for agriculture in parts of Indian Punjab, with greater production as compared to northern Sindh, it is better to allow food exports from there to Pakistan than to develop new but inefficient irrigation infrastructure in Sindh. This concept suggests that the amount of water needed to produce a particular product and where the water is most efficiently utilized should be deciding factors in prioritizing trade flows.[xxxix]

Essentially, the key to South Asian food security in a changing climatic situation is the development of better regional trade pacts to allow for food flows. (See India-Pakistan trade paper in this New America Foundation Research Series: "Enhancing India-Pakistan Trade"[xl]).

Trade will be an essential aspect of alleviating food security challenges and fostering cooperation in the SAARC region. In June 2012, Sri Lanka hosted an important effort led by civil society groups on "Emerging Issues on Climate Change, International Trade and Food Security." Sri Lankan Environment Minister Anura Priyadarshana Yapa, in opening the seminar, noted that: "Many of the factors impacted (by climate change) such as agriculture, forestry, fisheries and tourism are critical for South Asian countries. Climate change is likely to alter the comparative advantage of these countries in such sectors, and thereby alter the pattern of international trade."[xli] In 2008, India's union minister for science technology and earth science at the time, Shri Kapil Sibal, launched a government Group on Climate Change Adaptation "cutting across departments in the two ministries to proactively prepare for providing technology required to comprehensively address issues related to climate change." This initiative, with a Centre for Climate Change Research initially to be located within the campus of the Indian Institute of Tropical Meteorology (IITM) at Pune, will address the scientific issues related to global warming and climate change.[xlii] Food security can be the fulcrum of such initiatives, which need to be linked to the broader development and trade agenda for South Asia.

Within the broader Asia-Pacific region there is also an important network on global change that incorporates strategies for dealing with food security. Established in 1996, the Asia-Pacific Network for Global Change Research (APN) comprises 22 member governments "whose vision is to enable countries in the region to successfully address

Global Change (GC) challenges through science-based response strategies and measures, effective science and policy linkages, and scientific capacity development."[xliii] The network includes countries as far afield as Russia and the United States but has a special interest in South Asia with reference to climate change and farming systems.[xliv]

Incorporating regional indicators of environmental conservation such as ecosystem service valuation techniques[xlv] may also help to create the incentive structure to conserve ecosystems across borders. A recent study by ICIMOD on the Kangchenjunga region along the Nepal-India border (crowned by the world's third highest mountain) estimated economic benefits generated by provisioning, regulating, and supporting ecosystem services to be $125 million (U.S.) per year, or $4,286 per hectare. Close to 80 percent of such benefits were derived from "provisioning services," goods from the corridor that are used directly or indirectly in terms of livelihood creation, with an average estimated benefit per household equivalent to 80 percent of total household income. The value of carbon sequestration services was close to 18 percent of the total value of the ecosystem services. The study noted the need to ensure regional cooperation around food supply chains and a recognition that trade involving forest products can have serious impact locally on livelihoods. Conservation and trade thus need to be planned regionally to prevent animosity and conflict.[xlvi]

Deforestation of the Himalayan foothills, where most of the human population in this mountainous region resides, is a major issue of concern and interest for regional cooperation. On the advent of World Environment Day in 2011, Pakistani President Asif Ali Zardari made a commitment under the Millennium Development Goals (MDGs) to increase national forest cover within Pakistan from 5 percent to 6 percent by the year 2015. This would bring an additional 1 million hectares of land area under forest.[xlvii] Similar regional targets and coordination to meet them through alternatives to wood fuel will be needed to make any such goals realistically achievable.

In 2007, SAARC took a bold step to initiate the first formal agreement for a regional "food bank"[xlviii] with clear specifications and risk assurance mechanisms. Despite procedural challenges, as of May 2012 the bank had successfully stockpiled about 486,000 tons of food for emergency response in member states.[xlix] Building on opportunities for further regional cooperation on food security, a SAARC seed bank was established at the SAARC Addu Island Summit in 2011. Sri Lanka agreed to host the seed bank with aims to "provide regional support to national seed security efforts, address regional seed shortages through collective actions and foster inter-country partnership."[l] The bank also aims to increase the rate of seed replacement with ecologically viable varieties. The idea of the seed bank was proposed a year earlier by Bangladeshi Prime Minister Sheikh Hasina at the 16th SAARC Summit (Thimphu, Bhutan) and was incorporated in the Thimphu Declaration. Bangladesh was tasked to prepare a concept paper and distributed the document among all member states through the secretariat. The process leading to the establishment of the bank within one year of its declaration shows that SAARC can deliver a deliberatively planned project when there is political will to do so.

The agreement establishing the bank also notes that member countries are expected to contribute 1 percent of their total seed requirement to the bank as reserve and to help member countries have a stock of quality seeds. There are also provisions to exchange seeds and plant genetic resources, and to share practices, technologies, and techniques to produce quality seeds. Under the agreement, all member countries will have enough stocks of quality seeds, and in the case of a natural disaster, one member can borrow from another.

Food security is an important strategy for fostering regional environmental cooperation and ties in with the broader strategy of developing the kind of adaptive responses to climate change that are gaining traction in related areas.

Derivative Convergence: Public Health, Maritime Cooperation, and International Treaties

Part of the attraction of an ecological approach to cooperation is that environmental factors cast a wide net for diplomacy and many different areas of cooperation can be connected and leveraged for greater benefit. For example, human health and well-being are most intimately tied to food production and climate change. Demographic stresses in South Asia will undoubtedly have a profound impact on public health. There are some direct transboundary aspects of regional health management, such as pollution traveling across borders from India to Pakistan or from Pakistan to Afghanistan, which need to be further examined, leading to some clear regional agreement on their control. The SAARC environment protocol may provide a mechanism for such an effort, but effective enforcement mechanisms will be required. Remote sensing technology could be useful in this regard, and collaborations with U.S. technical organizations such as NASA and the Army Corps of Engineers may be useful to consider. Support provided by such organizations in the past has been useful even in resolving international territorial disputes, such as in the Cordillera del Condor region of Ecuador and Peru, and in using environmental factors as a peace-building mechanism.[li]

Dr. Haider Warraich, among the few medical practitioners who have written about health-related cooperation in South Asia, notes that "in spite of the overwhelming need for collaboration in health and infectious diseases between India and Pakistan, no official channel is in place to conduct such an exchange."[lii] The Attari-Wagah border near Lahore in Pakistan is used as a quarantine location to vaccinate children crossing the border to prevent the spread of polio (which has been increasing at an alarming rate in Pakistan). Fumigation of trains passing the border has been carried out regularly during public health emergencies and some cross-border coordination may occur for such a purpose.

Health visas are granted by India for Pakistani patients on a fairly regular but limited basis.[liii] The Indian High Commission in Islamabad issued 1,992 medical visas to Pakistani citizens during 2008-2010. In addition, 2,917 visas were issued to medical attendants during the same period. However, there is little exchange of expertise across the region. Public health issues related to changes in regional ecology and movements of people have also been noted as areas for potential cooperation between India and Pakistan in the context of Afghanistan's development.[liv] The Mekong-Ganga Cooperation initiative also recognized the importance of health cooperation, particularly within the context of riparian systems, and at its sixth ministerial meeting in New Delhi (September 2012) decided to include health as an area of immediate cooperation.[lv] Given the lessons on dengue control in Southeast Asian countries such as Thailand, there could also be some prospect for transferability from this regional grouping to SAARC states via India, the common regional partner in both organizations.

Another regional organization with potential for a stronger role on derivative environmental issues is the South Asia Co-operative Environment Programme (SACEP), established as an inter-governmental organization by the United Nations Environment Programme in 1982 (thus predating SAARC) and headquartered in Colombo, Sri Lanka. The primary function of SACEP is to work with its eight member countries:[lvi]

To promote cooperative activities in priority areas of environment of mutual concern

To ensure that these activities are beneficial individually and collectively to the member states of the region

To extend support as needed through exchange of knowledge and expertise available among the member countries

To provide local resources towards implementation of projects and activities

To maximize the impact of support received from donor countries and other sources

Currently the governing council of SACEP, which comprises environment and climate change ministers of the eight member states, has prioritized three areas for programmatic focus: a) waste management; b) adaptation to climate change; and c) data management. Using an existing ministerial organization such as SACEP, complemented by ICIMOD, to coordinate technical aspects of cooperation, and linking this to the more geopolitical aspects of cooperation through the rudimentary SAARC environment protocol, would be a promising approach to integrating cooperation.

Coastal areas where there are additional threats to human welfare from natural disasters and navigational hazards also have the potential for fostering greater cooperation. The University of Ottawa and Dalhousie University in Canada have hosted a series of Track 2[lvii] diplomatic efforts in this regard over the past few years. In a recent statement issued by this Track 2 group in partnership with the Atlantic Council, it was noted that electronic links for navigational cooperation between maritime authorities in India and Pakistan had worked well between 2005 and 2010 and that an agreement had been signed to continue these links until 2016. However, these efforts then fell into disuse until last year, when the Joint Commission of the two countries was revitalized. In July 2012 a meeting of the Indo-Pak maritime authorities also began the process of working out an efficient mechanism for resolving cases of inadvertent line-crossers at sea (usually innocent fishermen).[lviii]

The plight of coastal fishermen will become even more precarious as climate change and impacts on fisheries may lead them to venture into yet unfamiliar waters in search of stocks.

Efforts to efficiently regulate the maritime arena should also be linked to the long-standing yet strategically insignificant dispute over Sir Creek in the Indus delta region bordering Sindh (Pakistan) and Gujarat (India). India argues for a "mid-channel" approach, while Pakistan cites a British demarcation document that sets the eastern shore of the waterway as the boundary (known as the "green line"). During the 11th round of talks in May 2011, both sides agreed to exchange non-papers[lix] on Sir Creek. In the 12th round of talks of the joint working group in New Delhi in June 2012, certain suggestions were made by both parties to resolve the dispute but there was no consensus.

Environmental peace-building strategies in this case could well be applied by invoking international environmental agreements.[lx] In particular, the Convention on Wetlands of International Importance,[lxi] adopted in the Iranian city of Ramsar in 1971, is the only global environmental treaty that deals with one particular kind of ecosystem—wetlands. With over 40 years of experience in international wetland conservation and ratified by 160 countries, it can offer a significant contribution to environmental diplomacy and is well-suited for regions such as riparian zones in South Asia that may already have Ramsar wetland designations.

Several other international environmental agreements to which India and Pakistan are both signatories could be applied toward regional cooperation goals with minimal political risk (See Appendix 2). In particular, since countries are obligated under treaties to engage in transboundary initiatives, they can proceed with regional cooperative efforts without explicitly supporting multilateralism.

Given the enormous need to build "trust capital" in South Asia, a host of such hybrid strategies will be required, and they should involve pushing forward with some modicum of multilateralism while also pulling inward with calls for enlightened self-interest around trade and ecological resilience.

An Agenda for Action: Bridging Track 1 and Track 2 Diplomatic Efforts

South Asian diplomacy has taken on a broad range of technocratic initiatives that are achieving more success in comparison with relatively scant progress on territorial disputes. Despite the general stagnation of diplomacy in South Asia, particularly since the Mumbai attacks of 2009,

there are some signs of progress that should be used to promote a clear agenda for sustainable cooperation. In September 2012, the Pakistan-India Joint Commission (originally established in 1983[lxii]) was revived after a seven-year hiatus. It identified eight avenues of "mutually beneficial cooperation" in agriculture, education, environment, health, information, IT and telecommunications, science and technology, and tourism. The working groups within the commission that focused on agriculture, environment, and science are of particular relevance to this report. Noted in particular was the need to train scientists in crop improvement through the use of biotechnology, quarantine-related matters, livestock and dairy development, high-efficiency irrigation systems, and rainwater harvesting. The working group on environment agreed to cooperate on climate change, renewable energy, environmental protection, energy conservation, clean development mechanisms, biodiversity, sustainable forest conservation, and solid waste management. The commission's revival is the most promising sign that some long-term cooperation around ecological issues may indeed be possible and could have a much larger impact on conflict resolution at the bilateral and regional levels.

Conclusions and Recommendations: The Way Forward

Based on the analysis in this report, the following policy recommendations should be considered to facilitate the use of environmental factors in promoting regional cooperation and particularly in improving relations between India and Pakistan:

Salience of SAARC: The proliferation of regional cooperation organizations should not undermine SAARC, which remains the most comprehensive regional organization in terms of ecological approaches to international relations. Though trade matters can be tentatively decoupled from SAARC through some other derivative agreements (such as BIMSTEC), environmental cooperation should remain within the SAARC mandate and empowered through the adoption of the SAARC convention on the environment. Programs such as the USAID-supported South Asia Regional Initiative for Energy (SARI/Energy) should be linked to SAARC programming to strengthen the organization rather than being implemented in isolation. Issues such as transboundary pollution concerns in river systems could be tackled within such a convention even if the more intractable issues of water quantity are handled bilaterally.

Beyond the Indus Waters Treaty: Instead of focusing on ways to renegotiate the terms of the Indus Waters Treaty, there should be greater policy emphasis on water and energy conservation strategies, which would reduce existing tensions between India and Pakistan and delay the need for large, contentious infrastructure projects. The "trust capital" generated through the exchange of conservation technologies could in turn lead to more integrated energy and water agreements that focus on regional efficiency and interdependence rather than national self-sufficiency.

Mountains Matter: The Himalayas and mountain conservation science should be a focal point for cooperation efforts because they are the most consequential determinants of the impact of climatic change. Cooperation to deal with ecological stresses, particularly water and food availability, has much potential for further engagement. . The Himalayan range is also the location of many intractable conflicts in the region; hence, reframing the impact of those conflicts in terms of ecology may result in promoting Track 1 diplomacy with a broader vision of dispute resolution. ICIMOD should be empowered by donors and by the Indian and Pakistani governments to play a more direct and significant role in promoting cooperative research on mountain ecosystems, including the Kashmir region. One example would be to link the Kailash and Karakoram-Pamir initiatives, which ICIMOD launched, to allow for Indo-Pak collaboration in these transboundary efforts.

Invoking Environmental Treaties: South Asian countries have been particularly proactive in ratifying international

environmental treaties (See Appendix 1). In particular India and Pakistan have both ratified the Convention on Biological Diversity, the U.N. Framework Convention on Climate Change, the U.N. Convention to Combat Desertification, and the Ramsar Convention on Protection of Wetlands. All of these treaties have transboundary implementation agendas that can be invoked as a means of facilitating ecological cooperation. However, since these treaties are largely "soft law," more concerted international pressure will be needed at conferences of the parties to these treaties to prioritize transboundary conservation as a means of broader cooperation.

Broadening Knowledge Networks: Using science as a peace-building strategy through collaborative research programs should be further encouraged. Current visa-granting processes discourage scientific collaboration (while cultural exchanges are encouraged). A special category for longer-term scientific collaboration visas among SAARC countries should be developed (which would entail an expansion of the current SAARC visa scheme). International donors should encourage the establishment of joint research programs, with some grant schemes exclusively allocated for collaborative research between Indian and Pakistani scientists. The initial efforts undertaken in this regard by the U.S. National Science Foundation and Sandia National Labs need to be strengthened on a longer-term basis so the collaboration can be sustained and trust capital further established. Existing knowledge networks like SANDEE and CDKN can play a facilitative role in this regard.

Crisis Communication: Although there have been limited peace dividends in South Asia from natural disasters such as the Kashmir earthquake of 2005, the Indus floods of 2010, and the Siachen avalanche of 2012, there has been some progress in improved communication following these crises. Building on this initial success, there should be particular emphasis on the communication of health data and navigational data, particularly in the context of maritime corridors. The recommendations from various Track 2 diplomacy processes underway for the past several years (see Appendix 1 as an example) should be considered for implementation within the context of Track 1 bodies such as the India-Pakistan Joint Commission. The inability of India and Pakistan to reconcile their differences has been perpetuated by the international community's apathy in terms of incentivizing cooperation between the two countries. Given the high deficit of Indo-Pak trust, external influence is essential to stimulate cooperation, no matter what the parties' initial protestations may be. An environmental route to motivating such cooperation would provide a relatively mild and nonthreatening opportunity for external involvement through donor pressure as well as diplomatic intervention. Such intervention could take the form of a more active role for special envoys with a clear mandate on environmental cooperation as well as a clear linkage between trade concessions and ecologically premised dispute resolution.

These policy recommendations require a broadening of the current vision within South Asian countries from bilateralism to multilateralism. Although structures such as SAARC are limited by their charters from engaging in intractable disputes, leaving these conflicts instead to bilateral dialogue, such an approach is becoming increasingly moribund. A multitrack approach to diplomacy is needed, in which bilateral conversations are considered appropriate for specific issue discussions, while underlying ecological factors may require multilateral engagement. With the growth and strengthening of regional cooperation networks east and west of the region, there is likely to be more receptivity to such an approach. The United States has been bolder than many other external actors in pursuing this strategy, by having special envoys to the region while promoting regionally specific funds for technical cooperation and dialogue, but it has been reluctant to apply its influence in the context of bridging Track 1 and Track 2 processes. The growing economic leverage of American private investment in the region, as well as the large amounts of development assistance provided by the United States to South Asia in partnership with other allies, has the potential for creating a more

ecologically harmonious approach to regional cooperation and consequently enhanced international security.

Appendix 1: India-Pakistan Confidence-Building Mechanisms (CBMs) project of the Atlantic Council and the University of Ottawa

Siachen Proposal, released October 2, 2012 (excerpts)

Co-chairs:
General Jehangir Karamat (Pakistan Army Retd)
Air Chief Marshal Shashi Tyagi (Indian Air Force Retd)

Lieutenant General Sikander Afzal (Pakistan Army, Retd)
Rana Banerji (former Special Secretary, Cabinet Secretariat, India)
Air Vice Marshal Shahzad Chaudhry (Pakistan Air Force, Retd)
Lieutenant General (Retd) Tariq Ghazi (former Defense Secretary of Pakistan)
Ambassador Maleeha Lodhi (Pakistan Foreign Service, Retd)
Brigadier Gurmeet Kanwal (Indian Army, Retd)
Ambassador Vivek Katju (Indian Foreign Service, Retd)
Ambassador Aziz Khan (Pakistan Foreign Service, Retd)
Admiral Tariq Khan (Pakistan Navy, Retd)
Ambassador Riaz Khan (former Foreign Secretary of Pakistan)
General Tariq Majid (Pakistan Army, Retd)
Ambassador Lalit Mansingh (former Foreign Secretary of India)
Lieutenant General BS Pawar (Indian Army, Retd)
Major General Qasim Qureshi (Pakistan Army, Retd)
Brigadier Arun Sahgal (Indian Army, Retd)
Ajai Shukla (Journalist)
Vice Admiral A.K. Singh (Indian Navy, Retd)
Lieutenant General Aditya Singh (Indian Army, Retd)

Notwithstanding the claims of each country, both sides should agree to withdraw from the conflict area while retaining the option of punitive action should the other side renege on the commitments. The following clear package of integrated and inter-linked stipulations were laid down for the demilitarisation of the area and delineation of the line:

Set up a joint commission to delineate the line beyond NJ 9842, consistent with existing Agreements;
The present ground positions would be jointly recorded and the records exchanged;
The determination of the places to which redeployment will be affected would be jointly agreed;
Disengagement and demilitarization would occur in accordance with a mutually acceptable time frame to be agreed (see Annex 1);
Prior to withdrawal, each side will undertake to remove munitions and other military equipment and waste from areas of its control; and
Ongoing cooperative monitoring of these activities and the resulting demilitarized zone would be agreed to ensure/assure transparency (see Annex 2).

In keeping with the Simla Agreement and the Lahore Declaration both sides should undertake that resolution of this issue is a bilateral matter and that there will be no change in the status of the area and also that no personnel of any third country will be permitted within it unless cleared by the two countries jointly.

Annex 1

Suggested Time Frame for Demilitarisation

Schedule for Demilitarisation

Operational principles:

Establish a Joint Working Group to recommend detailed re-deployment and oversee implementation of the process.
Variability in the process is likely, due to frequently changing weather conditions.

Weather forces disengagement to be conducted during the summer season (May – September)
Determination of the place (s) to which redeployment will be effected and the time frame to be recommended by the Joint Working Group.

Mechanism for joint management of the demilitarized zone to be recommended by the Joint Working Group.

Possible Phases of Demilitarisation (with appropriate waste and munitions removal at each phase)
Phase 1: Withdraw medium artillery located near Base Camps (e.g., Dzingrulma, Gyari)
Phase 2: Withdraw troops and field artillery from Northern, Central, and Southern battalion sub-sectors
Forward posts, including crew-served weapons posts
Declare staging camps where troops from forward positions will transit through in the process of re-deployment
Dismantle camps after withdrawal

Phase 3: Withdraw from forward logistics camps on or near the Glacier
Phase 4: Dismantle remaining logistics camps
Phase 5: Withdraw from base camps
Phase 6: Dismantle or convert base camps to scientific/civil use
Ongoing: Cooperative monitoring and verification of demilitarization (see Annex 2)

Annex 2
Monitoring and Verification of the Demilitarisation
Overall Concept
Monitoring initially, by national technical means
Phase 1: Monitoring and verification of disengagement during the establishment of the DMZ
Verify that posts, logistics centers, and base camps vacated
Phase 2: Post-disengagement monitoring of the DMZ
Verify that military personnel and equipment do not re-enter the DMZ
On an ongoing basis, the primary monitoring and verification mechanisms will be both bilateral and cooperative

Goal is to verify withdrawal and dismantlement of military facilities
Visual: The withdrawal from Indian and Pakistani posts within line of sight of each other is to be coordinated so each side can observe the activities of the other. Ammunition and heavy weapons which cannot be moved immediately will be temporarily stored in-place and subject to joint verification and monitoring.
Joint Aerial Reconnaissance: A pair of Indian and Pakistani helicopters will rendezvous at an agreed location and then fly together along the Forward Battle Positions in the agreed sector to visually verify and photographically record withdrawal and dismantlement of post or logistics camp.
On-site inspection: Both sides have the right to request that its representative land by helicopter at a location to confirm withdrawal and dismantlement.
Unilateral activities: Both sides should agree not to interfere with the other's national technical means

Goal of detecting illicit re-occupation of positions within the DMZ
Monitoring and verification considerations:
Nothing happens quickly on Siachen; logistics and weather drive all
The possibility of a quick, stealthy reoccupation, without an air bridge, is remote
Aerial operations are obvious

Small-scale intrusions are neither significant nor sustainable

Monitoring and verification should focus on logistics:

All Indian logistics flows through Dzingrulma

Pakistan has multiple logistics routes through civilian villages

Appendix 2. Major International Environmental Treaties and Ratification Status of South Asian States

	Convention on Biological Diversity[1]	Ramsar Convention on Wetland Protection[2]	UN Framework Convention on Climate Change[3]	UN Convention on Desertification[4]	CITES (Trade in Endangered Species)[5]	Asia-Pacific Partnership on Clean Development and Climate[6]	Doha Declaration on the TRIPS Agreement and Public Health[7]
Pakistan	Y	Y	Y	Y	Y		Y
India	Y	Y	Y	Y	Y	Y	Y
Nepal	Y	Y	Y	Y	Y		Y
China	Y	Y	Y	Y	Y	Y	Y
Afghanistan	Y		Y	Y	Y		
Bhutan	Y	Y	Y	Y	Y		
Bangladesh	Y	Y	Y	Y	Y		Y
Myanmar	Y	Y	Y		Y		Y

1 http://www.cbd.int/convention/parties/list/

2 http://www.ramsar.org/cda/en/ramsar-about-parties-parties/main/ramsar/1-36-123%5E23808_4000_0__

3 http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php

4 http://www.unccd.int/en/Pages/default.aspx

5 http://www.cites.org/eng/disc/parties/alphabet.php

6 http://www.asiapacificpartnership.org/english/about.aspx

7 http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm.

[i] World Bank estimates derived from South Asia portal on World Bank web site

[ii] For a detailed review of SAARC's limitations based on these principles, see Ahmed, Zahid Shah, *Regionalism and Regional Security in South Asia: The Role of SAARC*. Oxford UK: Ashgate Publications, 2013.

[iii] Recognizing the importance of development donors and broader strategic interests, SAARC has also granted observer status to Australia, China, the European Union, Japan, Iran, Mauritius, Myanmar, South Korea, and the United States.

[iv] For a good review of the early days of ECO, refer to Pomfret, Richard. "The Economic Cooperation Organization: Current Status and Future Prospects." *Europe-Asia Studies* 49, no. 4 (1997): 657–667. Also, for a broader discussion of regional organizations and their role in peace-building in the region, see Rubin, Barnett R., and Ahmed Rashid. "From Great Game to Grand Bargain - Ending Chaos in Afghanistan and Pakistan." *Foreign Affairs* 87 (2008): 30.

[v] "Pakistan PM to take-up Pak-Tajik road project." *The Daily Times* (Pakistan), October 10, 2011.

[vi] Speech by Geoffrey Pyatt, principal assistant secretary, Bureau of South and Central Asia, "Delivering the New Silk Road," Tokyo, Japan, July, 9, 2012. Accessed online from U.S. Department of State official site

[vii] For a review of SCO in the context of regional environmental cooperation see Wang Fen (2011). *Grand Strategy in the Great Game--Strategic Interests and Objectives of States of the Shanghai Cooperation Organization.* Burlington, Vt.: Institute for Environmental Diplomacy & Security at the University of Vermont.

[viii] South Asian University, New Delhi, Web site accessed September 1, 2012

[ix] Peoples' SAARC Web site, accessed September 2, 2012

[x] Indian Prime Minister Manmohan Singh's statement on NDTV web site, accessed September 2, 2012

[xi] SAARC. *Regional Study on the Causes and Consequences of Natural Disasters and the Protection and Preservation of the Environment*. Kathmandu, Nepal, SAARC Publications, p. 206.

[xii] Desai, V.V. *Political Economy of Regional Cooperation in South Asia*, Manila, Philippines, Asian Development Bank Working Paper Series on Regional Integration, No. 43, July, 2010.

[xiii] International Centre for Integrated Mountain Development (ICIMOD). Mission statement online

[xiv] United Nations Environment Programme and ICIMOD, "The Kailash Sacred Landscape Conservation Initiative." Informational document online, 2011.

[xv] ICIMOD, *Toward Developing the Karakoram-Pamir Landscape,* Kathmandu, Nepal, ICIMOD: 2012.

[xvi] Personal communication via phone with ICIMOD country director in Islamabad, Pakistan, Dr. Abdul Wahid Jasra, November 8, 2012. Pakistan and Afghanistan are the only two countries where ICIMOD has regional offices with an aim toward more localized development priorities. (The Pakistan office was established after the Kashmir earthquake and has continued as a positive legacy of the relief and scientific research effort at the time.)

[xvii] For an excellent review of the controversies regarding glacial recession or accession due to climate change in this region and the ostensible concerns about data reliability, see: Bolch, T., A. Kulkarni, A. Kääb, C. Huggel, F. Paul, J. G. Cogley, H. Frey, et al. "The State and Fate of Himalayan Glaciers." *Science* 336, no. 6079 (April 20, 2012): 310–314.

[xviii] Numerous articles and links related to efforts on Indo-Pak cooperation for scientific research can be found through the following article online: Ali, Saleem H. "Siachen tragedy: an opportunity for peace." National Geographic Newswatch, April 7, 2012

[xix] See, for example, Bagla, Pallava. "Pakistan Gives Geology Conference the Cold Shoulder." *Science* 312, no. 5777 (May 26, 2006): 1117–1117. Also, cooperative attempts are profiled in Bagla, Pallava. "Across a Political Divide, Researchers Converge on Himalayan Plan." *Science* 313, no. 5783 (July 7, 2006): 30–31.

[xx] South Asian Network for Development Economics and the Environment, Kathmandu, Nepal.

[xxi] *SANDEE, a Decade in Focus,* Kathmandu, Nepal, South Asian Network for Development and Environment Economics, 2011.

[xxii] Timmons, Heather. "India Announces a Climate Change Plan." *The New York Times*, June 30, 2008.

[xxiii] Address by Shri Pranab Mukherjee, external affairs minister, On India And Global Challenges: Climate Change And Energy Security, at the Asia Society, New York, September 30, 2008.

[xxiv] The LEAD network of non-governmental organizations was initiated by the Rockefeller Foundation in 1995 to create and sustain a global network of leaders who are committed to promote change toward patterns of sustainable development that are economically sound, environmentally responsible, and socially equitable, in line with Agenda 21 promulgated at the United Nations Conference on Environment and Development (UNCED: Rio Summit, 1992).

[xxv] Personal communication via e-mail with Ali Tauqir Sheikh, CEO, LEAD-Pakistan, and director, CDKN, December 20, 2012.

[xxvi] Renner, Michael. "Water as a Transborder Problem of Afghanistan" in Henning Riecke (ed.), *Partners for Stability: Involving Neighbors in Afghanistan's Reconstruction - Transatlantic Approaches*. DGAP Schriften zur Internationalen Politik. Baden-Baden, Germany: Nomos Verlag, 2012. Renner notes that the East-West Institute attempted preventive diplomacy initiatives in 2009, bringing officials and experts from Afghanistan, its neighbors, NATO, and the U.N. together for policy dialogues on regional water cooperation, agricultural development, and energy production.

[xxvii] World Meteorological Organization, *Establishment of a Regional Flood Monitoring System*. Kathmandu, Nepal, ICIMOD Publications, 2012.

[xxviii] Ibid, p. 3.

[xxix] For a detailed discussion of the treaty and its most recent dispute decision on the Baglihar Dam, see Salman, M., A. Salman, "The Baglihar Difference and the Resolution Process: A Triumph for the Indus Waters Treaty?" *Water Policy* 10 (2008).

[xxx] Parsai, Gargi. "India for Arbitration of Tulbul Row." *The Hindustan Times*, March 30, 2012. The World Bank's arbitration process that has been reviewing the Kishanganga dispute issued an order in October 2012 allowing a Pakistani delegation to inspect the site of the dam and visit the Wullar Barrage and Tulbul navigation projects.

[xxxi] Dywer, Gwynne, "A Question of Water for Pakistan." Syndicated column, published online in various sources, August 20, 2010, Vancouver

[xxxii] "India's move to fill Nimoo-Bazgo dam in J&K irks Pak." Rediff News, August 12, 2012

[xxxiii] Kugelman, Michael. "Repairs could stifle South Asia's water war." *Global Times,* October 11, 2012.

[xxxiv] See Ali, Saleem H. "Energizing Peace: The role of oil and gas pipelines in regional cooperation." Brookings Doha Centre, 2010. The TAPI and IPI pipeline projects and their geopolitics as well as technical prospects are discussed with comparisons to other regional pipelines.

[xxxv] The Energy Charter is a treaty-based agreement for improving international cooperation on energy trade and transit and providing for a dispute resolution mechanism (established in 1991).

[xxxvi] As noted on the Energy Charter web site accessed November 5, 2012. "Taking into account the position of the EU, the Charter Conference decided on 29 November 2011 to repeal the negotiation mandate of 2009. In view of the possibility of a reset of negotiations on a new Protocol, the Trade and Transit Group was tasked to conduct consultations among ECT members (in 2012), observers and industry representatives, in order to obtain more information with regard to the prospects for such an initiative, including the issues to be addressed and the convergence of positions within the constituency in this regard."

[xxxvii] Mission statement from SARI/Energy web site, accessed November 4, 2012.

[xxxviii] "Hanoi's support sought for Dhaka's entry." The News Today, Dhaka, November 2, 2012

[xxxix] The concept was first noted by J.A. Allan in 1997 in a working paper in the context of resolving Middle East water disputes. Allan has since synthesized the matter in a recent book. Allan, Tony. *Virtual Water: Tackling the Threat to Our Planet's Most Precious Resource*. Original. I.B.Tauris, 2011.

[xl] Taneja, Nisha "Enhancing India-Pakistan Trade," New America Foundation, January 16, 2013.

[xli] Speech by Minister of Environment of Sri Lanka,Hon. Anura P. Yapa, June, 2012, Accessible Online via Institute of Policy Studies of Sri Lanka

[xlii] Speech given at 95th Indian Science Congress, Andhra University, Visakhapatnam.

[xliii] Asia-Pacific Network for Global Change Research, web site accessed, November 1, 2012

[xliv] Holger Meinke, diagram published in *Climate in Asia and Pacific: A Synthesis.* Asia-Pacific Network for Global Change Research, 2011.

[xlv] Ecosystem service valuation techniques are used to provide some quantitative metrics to services provided by natural systems such as forests preventing erosion. For further details on this concept refer to Kareiva, Peter, Heather Tallis, Taylor H. Ricketts, Gretchen C. Daily, and Stephen Polasky. *Natural Capital: Theory and Practice of Mapping Ecosystem Services*. Oxford University Press, USA, 2011.

[xlvi] Pant, K.P.; Rasul, G.; Chettri, N.; Rai, K.R.; Sharma, E. (2012) *Value of forest ecosystem services: A quantitative estimation from the Kangchenjunga landscape in eastern Nepal.* ICIMOD Working Paper 2012/5. Kathmandu: ICIMOD.

[xlvii] Message from Mr. Asif Ali Zardari, president of the Islamic Republic of Pakistan (On the World Environment Day 5 June, 2011).

[xlviii] SAARC regional food bank mandate document accessed online, October 14, 2012

[xlix] There has been concerted citizen activism around making the SAARC food bank more transparent and effective, which may have led to improvements. A policy brief was prepared by the Bangladeshi NGO *EquityBD* for the Peoples' SAARC summit in 2011

[l] Sri Lanka to Set Up SAARC Seed Bank, Miadhu News November 11, 2011

[li] Refer to Ali, Saleem H. *Transboundary Conservation and Conflict Resolution: Lessons from projects commissioned by the International Tropical Timber Organization (ITTO).* Yokohama, Japan: United Nations University, Institute for Advanced Studies, 2011

[lii] Warraich, Haider. "Cross-border Contagions." Foreign Policy Online Afpak Channel, October 14, 2011

[liii] Ahmed, Masoor. "Vast Room for Pak-India Cooperation in Health Sector." The News International, May 7, 2012

[liv] Hameed, Sadika. *Prospects for India-Pakistan Cooperation in Afghanistan.* Center for Strategic and International Studies, August 2012

[lv] Sixth Mekong-Ganga Cooperation meeting. Notes from The Calibre, New Delhi, India, September, 2012

[lvi] Details from the SACEP Web Site

[lvii] The term Track 2 refers to informal efforts at diplomacy that are not mandated by governments, whereas Track 1 refers to government-mandated programs. The term has its origins in Davidson, William and Joseph Montville, "Foreign Policy According to Freud." *Foreign Policy*, No. 45, (Winter 1981-1982) pp. 145-157.

[lviii] Statement issued by the Track 2 diplomacy project of the Atlantic Council and the University of Ottawa related to confidence-building measures following a meeting of the Indo-Pak working group in Lahore, October 2, 2012.

[lix] A "non-paper" is an internal document without ascription that is circulated as part of diplomatic communications.

[lx] Ali, Saleem H. and Pamela Griffin, "Wetland Diplomacy: Transboundary Conservation and Ramsar" United Nations University, One World, May 18, 2012.

[lxi] Details of Ramsar convention accessed via Ramsar secretariat website, November 1, 2012

[lxii] The commission met for the first time in 1983; its second and third meetings took place in 1985 and 1989,

respectively. There were no further meetings until the two countries reactivated the mechanism in April 2005, during the visit of then Pakistani President Pervez Musharraf, following which the technical groups were raised from four to eight.

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