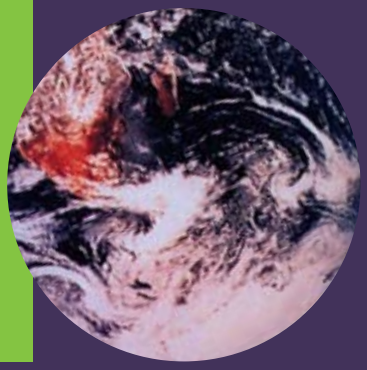

ASIA ASSESSMENT

ENVIRONMENTAL CONFLICT AND COOPERATION IN SOUTH ASIA:

PROSPECTS FOR TRANSBOUNDARY DISPUTE RESOLUTION WITH SHARED WATER RESOURCES

Report of the Regional Consultation
5-6 June 2006, Bangkok, Thailand

Saleem H. Ali, University of Vermont, USA
Shaista Tabassum, University of Karachi, Pakistan
Geoffrey Dabelko, Woodrow Wilson Center, USA

With research assistance from Todd Walters

A Product of the Environment and Conflict Prevention Initiative
of the UNEP's Division of Early Warning and Assessment

December 2007

UNEP

Woodrow Wilson International Center for Scholars

United Nations Environment Programme

ASIA ASSESSMENT

ENVIRONMENTAL CONFLICT AND COOPERATION IN SOUTH ASIA:

PROSPECTS FOR TRANSBOUNDARY DISPUTE RESOLUTION WITH SHARED WATER RESOURCES

Report of the Regional Consultation
5-6 June 2006, Bangkok, Thailand

Saleem H. Ali, University of Vermont, USA
Shaista Tabassum, University of Karachi, Pakistan
Geoffrey Dabelko, Woodrow Wilson Center, USA

With research assistance from Todd Walters

A product of the Environment and Conflict Prevention Initiative
of the UNEP's Division of Early Warning and Assessment

December 2007

Disclaimers

The views expressed in this paper are those of the authors and do not necessarily reflect the views of the United Nations Environment Programme.

The designations employed and the presentation of material in this paper do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city, or its authorities, or concerning the delimitation of its frontiers or boundaries.

1. Introduction

Are environmental degradation and political instability inextricably linked, or can cooperative action to share natural resources and preserve the environment contribute to peace? The relationship between environmental degradation and political instability—whether it is insecurity or violent conflict—is poorly understood. Accordingly, policymakers' interventions do not reliably address these links. The international community (including the United Nations) increasingly recognizes that these gaps in our understanding prevent us from developing cooperative mechanisms for peacebuilding and conflict prevention. We need a more systematic assessment of the relationship between environment and security and a more careful consideration of the links among environmental degradation, natural resources, and development.

Natural resources are distributed unequally throughout the world. In some cases, scarcity (of water, fish, forests, or arable land, for example) or abundance (of oil, diamonds, or other valuable resources) has contributed to violence within and between states. Environmental change may have a similar impact. For example, experts predict that climate change will increase the severity of floods and droughts, which may lead to mass migration, undercut state capacities, and exacerbate widespread poverty.[1] Environmental stresses, and the social phenomena they engender, have both direct and indirect ties to the global community's greatest challenges: poverty, terrorism, globalization, poor governance, and inequality.

Former UN Secretary-General Kofi Annan highlighted the connection between environment and conflict in his September 2003 report on the prevention of armed conflict: "Lastly, in addressing the root causes of armed conflict, the United Nations system will need to devote greater attention to the potential threats posed by environmental problems." He continued:

> [T]he implications of the scarcity of certain natural resources, of the mismanagement or depletion of natural resources and of the unequal access to natural resources as potential causes of conflicts need to be more systematically addressed by the United Nations system. The United Nations system should consider ways to build additional capacity to analyse and address potential threats of conflicts emanating from international natural 2resource disparities.[2]

[1] See, for example, Schwartz, Peter & Doug Randall. (2003, October). *An abrupt climate change scenario and its implications for United States national security.* Retrieved 3 August 2004 from http://www.gbn.com/ArticleDisplayServlet.srv?aid=26231.

[2] United Nations. (2003, September 12). *Interim report of the Secretary-General on the prevention of armed conflict* (Report of the Secretary-General on the Work of the Organization, A/58/365–S/2003/888 12 September 2003).

Calling this post-Iraq moment "no less decisive than 1945 itself," in 2003, Annan convened a High-Level Panel on Threats, Challenges, and Change to improve how the United Nations prevents and removes threats to peace. Eminent citizens, including Brent Scowcroft, Gro Harlem Brundtland, Sadako Ogata, and Nafis Sadik, were asked to recommend clear and practical measures for ensuring effective collective responses to the world's security problems, ranging from terrorism and weapons of mass destruction to "soft threats" such as extreme poverty and disease.

Environmental issues are firmly on the UN agenda, but they tend to remain discrete topics that lack sufficient coordination across agencies. Annan has repeatedly maintained that environmental issues must be integrated into the United Nations' larger development and security agenda. In preparation for its December 2004 report, the High-Level Panel sought recommendations that, if adopted, would inject environmental issues into the security dialogue and transform words into results.

The High-Level Panel's final report, released in December 2004, recognizes the links between natural resources and conflict, and asserts that ensuring security in the developed world requires mitigating sources of regional, national, and local insecurity (e.g., poverty). The report incorporates some of the Panel's recommendations, such as addressing the security impacts of climate change, increasing the UN Secretariat's scientific knowledge and capacity, and helping the states most vulnerable to natural disasters improve their vulnerability assessments and strengthen their adaptive capacity. The High-Level Panel identified the lack of cooperation among UN entities focused on environment, development, and security as a key factor limiting effective response. It also indicated that national governments share the same bureaucratic impediments to tackling these cross-cutting challenges.

Annan's concern is shared by national governments, scientific institutions, and intergovernmental and nongovernmental organizations. In 2003, the UN Environment Programme (UNEP) asked these groups to identify the most serious gaps in global environmental assessments as part of its Governing Council's efforts to strengthen UNEP's scientific base. All four groups selected environment/conflict as one of the most important thematic areas lacking adequate coverage.[3]

UNEP seeks to respond to these calls for action. Founded in 1972, UNEP has recognized the connection between environmental change and security for more than thirty years. It helped convene the negotiations that led to the 1977

[3] The other thematic areas of most concern were poverty and environment, trade and environment, and ecosystem services; see pages 16-17 of UNEP's December 2003 *Draft report of additional questions on strengthening the scientific base of the United Nations Environment Programme* (UNEP/SI/IGC/INF/1). The results of the 2003 survey were presented at the Intergovernmental Consultation on Strengthening the Scientific Base of the United Nations Environment Programme, held 14-15 January 2004 (for more information, visit http://science.unep.org/).

Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (known as the ENMOD Treaty), in response to the controversial use of defoliants in Southeast Asia in the 1970s.[4] Environmental security concerns featured prominently in *Our Common Future*, the report that set the agenda for the 1992 World Summit on Environment and Development in Rio de Janeiro.[5] UNEP has sponsored research by the world's leading peace institutes on environmental contributions to conflict and instability.[6] More recently, the organization has conducted post-conflict environmental impact assessments in Sudan, Iraq, Afghanistan, Bosnia, and Liberia, among others, and formed a partnership with the UN Development Programme (UNDP) and the Organization for Security and Co-operation in Europe (OSCE) to identify environment and conflict hotspots in Central Asia and the Caucasus.[7]

With the cooperation of other divisions, and in response to Annan's call for greater integration and assessment of environment, conflict, and security connections,[8] UNEP's Division of Early Warning and Assessment (DEWA) developed an Environment and Conflict Prevention Initiative to coordinate and encourage international efforts to promote conflict prevention, peace, and cooperation through activities, policies, and actions related to environmental protection, restoration, and resources. This paper, a regional assessment of environment, conflict, and cooperation in the Indian Ocean basin, is one of three PCDMB assessments; the others analyze the Mesoamerican Biological Corridor and the Virunga Conservation Area in Africa's Great Lakes region.

2. Models of environmental cooperation

The distribution of environmental resources as a potential contributor to conflict has received considerable research and policy attention. These environment and conflict linkages have dominated the post-Cold War interest in environmental security. The distribution of environmental resources may contribute to conflict, but recent research has begun to focus on the potential for using environmental threats as a common aversion to stimulate conflict resolution (Græger, 2000, Conca and Dabelko, 2003, Ali, 2003, 2007).

Uniting around a common aversion to environmental threats, as well as confidence-building through environmental cooperation, potentially hold great

[4] Available online at http://www.unog.ch/frames/disarm/distreat/environ.pdf
[5] World Commission on Environment and Development. (1987). *Our common future.* Oxford: Oxford University Press.
[6] For example, UNEP and the International Peace Research Institute, Oslo (PRIO) agreed in 1988 to carry out "Studies in Environmental Security" at PRIO. A joint UNEP/PRIO program on "Military Activities and the Human Environment" comprised empirical research projects that were largely conceived and implemented by PRIO.
[7] For more information on UNEP's partnership with UNDP and OSCE, see the brief article by Gianluca Rampolla in *Understanding Environment, Conflict, and Cooperation.*
[8] Portions of the introduction appeared in *Understanding Environment, Conflict, and Cooperation* and Lonergan and Dabelko, 2005.

appeal for policymakers, as they are aimed at proactive problem-solving rather than merely more precise problem identification. What is most significant for government decision-makers to consider is that even if a conflict is not environmental in nature, the remedy may well be achieved through environmental means. Environmental cooperation may offer pathways to confidence-building or peacebuilding whether or not the conflict has environmental roots.

The key to analyzing environmental cooperation as a potential pathway to peacemaking is to dispense with notions of linear causality and instead consider conflict de-escalation processes nonlinear (not having a simple cause and effect relationship), often constituting a complex series of feedback loops (Ali, 2003). Positive exchanges and trust-building gestures are a consequence of realizing common environmental threats. Often, a focus on common environmental harms (or aversions) is psychologically more successful in leading to cooperative outcomes than a focus on common benefits, which may lead to competitive behavior over the distribution of the gains (Stein, 1993).

Some argue that cooperation on environmental issues among adversaries merely constitutes “low politics” and does not translate into larger resolutions over high-level national security concerns. In this view, environmental conservation would be at best a means of diplomatic maneuvering between mid-level bureaucrats, and at worst a tool for influential elites to pursue their own narrow interests. Such critics give examples of cooperation on water resources between adversarial states such as India and Pakistan or Jordan and Israel without this cooperation translating into broader reconciliation or peace (Lowi, 1995). Thus, some argue that resource and environmental issues are not important enough in world politics to play an instrumental role in conflict resolution.

However, a more positive framing of the case might reveal that water resources in this context are so important that adversaries must show some semblance of cooperation over them—even when that does not spillover into broader peace (Ali, 2003; Conca and Dabelko, 2003). Furthermore, the use of environmental issues in building peace must be considered over longer time horizons and repeated interactions, premised empirically on the following conditions (Axelrod, 1997):

- Development of a joint information base on a common environmental threat;
- Recognition that cooperation is essential to alleviate that threat;
- A cognitive connection and trust-building from initial environmental cooperation;
- Continued interactions over time due to environmental necessity;
- Clarification of misunderstandings and de-escalation of related conflicts; and
- Increased cooperation and resultant peacebuilding.

While there may be other pathways to environmental cooperation, we have chosen these most empirically observed mechanisms, following a collective review by policy analysts at a workshop organized by UNEP in March 2005.

The likelihood of environmental resources being used instrumentally in conflict resolution has increased in recent years (UNEP, 2004). Certain environmental resources are now better understood as fundamental to basic economic, environmental, and social processes, including sustaining human life. There is a growing realization that environmental issues require integrated solutions across national borders.

One of the earliest contributions to the study of environmental peacebuilding was Peter Haas' work in the context of the Mediterranean Action Plan (Haas, 1992). Haas focused on ways in which knowledge exchange promotes environmental cooperation through the formation of what he termed "epistemic communities," networks of professional experts who arrive at shared views on scientific policy questions. These networks often take the form of civil society groups—sometimes facilitated by development donors—that exchange information on environmental issues.

There is also a growing commitment from donors to "bioregionalism," the notion that ecological management must be defined by natural delineations such as watersheds and biomes rather than by national or other borders (Pirages and Cousins, 2005). Numerous joint environmental commissions between jurisdictions and countries have taken root all over the world, at times with implicit or explicit confidence- or peacebuilding goals. This evolution has also played out at various international fora in which bioregionalism and common environmental sensitivities have sometimes transcended traditional notions of state sovereignty.

3. Cooperation over water resources in South Asia

South Asia has a remarkable history of cooperation over water-related issues in both maritime and riparian areas. India is South Asia's major littoral state, and shares maritime borders with several other South Asian states; in contrast, none of the other states have maritime borders with each other. India has settled its maritime boundaries with several of its neighbors, signing 12 bilateral agreements, including nine agreements with the Maldives, two each with Sri Lanka, Indonesia, and Thailand, and one with Myanmar, as well as three trilateral agreements with Sri Lanka and the Maldives, Indonesia and Thailand, and Myanmar and Thailand.[9] Pakistan has also signed two bilateral agreements to settle its maritime disputes—one with Oman and the other with Iran.[10] However, maritime disputes continue between India and Pakistan and Bangladesh.

[9] 'Trends in the delimitation of India's Maritime boundaries', Rahul Roy Chaudhry, Institute of Defense and Strategic Analysis publication, New Delhi. (http://www.idsa.org/an-jan9-5.html).
[10] Pakistan Navy Hydrographic Department, Karachi.

In the case of Bangladesh and India, the problem is not the maritime boundary, which can be defined fairly easily, but rather competing sovereignty claims over the island of Talpati.[11] Bangladesh has a concave coast, and maritime boundaries in such geographical structures require integrative solutions and are extremely difficult to draw. Nevertheless, if a comprehensive settlement is reached in such cases, environmental factors can play a pivotal role, since they help link various issues such as economic development and security. For example, a joint conservation monitoring arrangement can allow both sides access to areas that would otherwise be off-limits and give both sides an opportunity to cooperate in reducing environmental degradation. In particular, states that are ecologically vulnerable to extreme climatic events, such as Bangladesh, are recognizing that poor environmental planning in coastal areas can have devastating economic impacts. The old environment-economy tradeoff is becoming less relevant as environmental pressures begin to have direct economic impacts. Pakistan's maritime dispute with India over the Sir Creek region, which will be discussed in this report, could conceivably provide an opportunity to forge such a link between economic development and environmental cooperation.

In addition to maritime dispute settlements, several important river-sharing treaties have also been concluded in South Asia. India has agreements with Nepal, Bangladesh, and Pakistan over riparian issues that are likely to be expanded in the future. Nepal, a small, landlocked neighbor of India, is the upper riparian on the Mahakali river, which flows from Nepal into India. After protracted negotiations, the two states agreed on a treaty on the river in 1996. The importance of water negotiations was highlighted by the fact that the Nepalese parliament passed the treaty with the required two-thirds majority, despite a serious political crisis in Nepal at the time. According to commentator Krishna Rajan: "The treaty attracted attention in a number of countries as an important indication of the ability of India and Nepal as multiparty democracies to reach an agreement on cooperation on water resources on the basis of equality, transparency and equitable sharing of costs and benefits...it does offer a model for India and Nepal on how to reach important understandings despite the uncertainties of democratic politics and coalition governments."[12]

Also in 1996, India and Bangladesh signed a treaty on India's construction of the Farakkha Barrage, a dam that diverts the flow of the Ganges river into the Hooghly river during the dry season to flush silt from the port of Calcutta. The negotiations were spread over two decades and, after overcoming a number of controversies, finally concluded in the form of a 30-year Farakkha Barrage Treaty.

---

[11] The island formed in the estuary of the Haribhanga river on the border between India and Bangladesh, probably after the tidal and cyclone of 1970, each of the states claims ownership of the island. For detail on the issue, see Kathryn Jacques, '*Bangladesh, India and Pakistan: International Relations and Regional Tensions in South Asia*, St. Martin's Press, Inc., New York, 2000, pp. 49-55.

[12] Nepal–India Relations , Krishna V.Rajan, South Asia Journal, Free Media Foundation, Lahore. January-March 2005, pp-82-87.

The monitoring ssytem in the treaty attempts to provide a mechanism to guard against abuse by either side, though some of the monitoring data often takes time to be made effectively available for dispute resolution. In February 2007, the Joint River Commission (JRC) from Dhakka released figures showing that during the first ten days of January, 2003 Ganges water available at the Hardinge bridge point was 54,415 cubic feet per second (cusecs) as against the indicative schedule of 67,516 cusecs for the period. Bangladesh's share of water of the river continues to fall short of the indicative schedule mentioned in the agreement. Since the signing of the Ganges Water Sharing Treaty in December 1996, Bangladesh' share was markedly less than the indicative schedule in the very first lean season that followed. It was also agreed between the parties under the treaty that the water sharing would be reviewed by the two governments at five years' interval or earlier, but so far no such review has taken place, except the meetings of the Joint River Commission. [13]

4. The Indus Waters Treaty

The most significant riparian agreement in the region has been the comprehensive treaty over the sharing of the waters of the Indus river between India and Pakistan. This is a particularly remarkable agreement since both sides have otherwise had tremendous hostility for one another and have defied efforts at cooperation. It is therefore instructive to consider the development and history of the treaty in greater detail as a potential model for regional environmental cooperation.

The Indus Waters Treaty is often cited as a success story of international riparian engagement, as it has withstood major wars between the two signatories (in 1965 and 1971), several skirmishes over water distribution, and derivative territorial concerns (Alam, 2002). The agreement is also heralded as a triumph for the World Bank, which played an instrumental role in its negotiation during the height of the Cold War. The World Bank's role in this region was particularly remarkable because India was a vanguard of the non-aligned movement and wanted to disavow any pressure from international institutions or Western nations.

Indeed, the initiator and technical adviser of the agreement was David Lilienthal, the former head of the United States' Tennessee Valley Authority, who suggested that an engineering perspective could contribute to resolving this political stalemate. After a visit to India and Pakistan in 1951, he advised the two countries to divide the Indus basin geographically. India would have unrestricted use of the three eastern rivers (the Ravi, Sutlej, and Bias), while Pakistan would completely control the three western rivers (the Jhelum, Chenab, and Indus). The World Bank played a significant role by providing mediation, support staff, funding, and proposals for pushing negotiations forward. Under the leadership of

[13] Hussain, 2005, p. 132

President David Black, the World Bank was able to persuade the international community to contribute nearly $900 million for impoundment construction.

Nine years after Lilienthal's initial visit, both countries were finally convinced to sign the agreement. The Indus Waters Treaty obligated Pakistan to build a canal system, which, by utilizing previously less-developed rivers, decreased Pakistan's dependence on the Indus tributaries the treaty gave to India. The treaty also charged India and Pakistan with exchanging information and establishing joint monitoring mechanisms of river flow to ensure enforcement.

The key provisions of the agreement are as follows:[14]

- An agreement that Pakistan would receive unrestricted use of the western rivers, which India would allow to flow unimpeded, with minor exceptions;

    - Provisions for three dams, eight link canals, three barrages, and 2,500 tube wells to be built in Pakistan;
    - A ten-year transition period, from April 1, 1960, to March 31, 1970, during which water would continue to be supplied to Pakistan according to a detailed schedule;
    - A schedule for India to provide its fixed financial contribution of $62 million in ten annual installments during the transition period; and
    - Additional provisions for data exchange and future cooperation.

As is often the case with riparian agreements, the treaty also established a permanent commission, the Permanent Indus Commission, made up of one Commissioner of Indus Waters from each country. In the technocratic spirit of the agreement, these representatives are often engineers rather than politicians. The two commissioners meet annually in order to:

- Establish and promote cooperative arrangements for implementation of the treaty;
- Promote cooperation between India and Pakistan in the development of the waters of the Indus system;
- Examine and resolve by agreement any question that may arise between the two countries concerning interpretation or implementation of the treaty; and
- Submit an annual report to the two governments.

Both countries have upheld the Indus Basin Commission's information-sharing responsibilities; data on new projects, the water level in rivers, and the water discharge of rivers are routinely conveyed to the other parties. If conflicts rise to the level of a dispute, the Indus River Commission will agree to mediation or

[14] Descriptive details about the Indus Basin Treaty are derived from textual information on the Transboundary Freshwater Dispute Database at Oregon State University. http://www.transboundarywaters.orst.edu/projects/casestudies/indus.html

arbitration, and the World Bank will appoint a neutral expert who is acceptable to both countries to resolve the dispute. Remarkably, India and Pakistan constructed and carried out this agreement amidst skirmishes, threats, and full-scale war, and even during armed conflict, neither country sabotaged the other's water projects. One of the water negotiators for Pakistan has commented that the role of international institutions is vital in making this enterprise function: "Both the parties are under the obligation of the Indus Waters Treaty, which asked the signatories not to disrupt the functioning of the commission. Any hurdle in the working of the commission is challengeable under the treaty, the guarantor of which is the World Bank'.[15]

Since 1960, no projects have been submitted under the treaty's provisions for "future cooperation," nor have any issues of water quality been submitted at all. There have, however, been several other disputes that have arisen over the years. The first issues arose from Indian non-delivery of some waters during 1965-66, but became instead a question of procedure and the legality of commission decisions. Negotiators resolved that each commissioner acted as a government representative and that their decisions were legally binding. Another dispute surrounding the design and construction of the Salal Dam on the Chenab river in Jammu, India was resolved through bilateral negotiations between the two governments.

As noted in a recent study of Pakistan's water policy (World Bank, 2005), India and Pakistan advocate conflicting principles of management: "equitable utilization" and "no appreciable harm," respectively. Both sides continued to foster misgivings about the treaty, but accept it as the best option in a time of conflict. From the Indian perspective, the fact that Pakistan received 75 percent of the water represented a fundamental violation of the principle of "equitable utilization." From the Pakistani perspective, the fact that they were allocated "only" 75 percent of the water when they possessed 90 percent of the irrigated land represented a violation of the principle of "no appreciable harm." As a mark of how leadership can achieve reconciliation despite high tensions, former Pakistani President Ayub Khan is quoted in the aforementioned study as saying: "We have been able to get the best that was possible….very often the best is the enemy of the good and in this case we have accepted the good after careful and realistic appreciation of our entire overall situation….The basis of this agreement is realism and pragmatism." (World Bank, 2005, p. 8).

As part of a study of the Tarbela and Mangla dams (the two Pakistani impoundments constructed as a result of the treaty), the World Commission on Dams concluded: "The Indus Waters Treaty represents the only ongoing agreement between India and Pakistan that has not been disrupted by wars or periods of high tension. Cooperation that builds on this treaty could not only present opportunities for better water management between those two countries,

[15] Capt. C.D Bhatti, Ministry of Defense, Government of Pakistan , Member of Pakistan delegation in the negotiations on Sir Creek 2000-2007.(Telephone conversation with the author, November 1, 2007)

but also serve as a model for water-sharing arrangements between India, Bangladesh, and Nepal." (Siddiqui, 2004).

Although the Indus Waters Treaty has been able to overcome some minor issues, such as the Salal dam dispute, which was resolved in 1978 through a new treaty. it has not been able to facilitate the resolution of larger conflicts, like Kashmir. Commenting on the potential for using the treaty as a conduit for resolving the Kashmir conflict, the Pakistani government senior spokesmen responded as follows: "The Indus Waters Treaty has been an important document for the water issue between the two countries. It has also helped in a framework for the resolution of water disputes in the region. Pakistan is fully committed to the treaty in letter and sprit. As far as the Kashmir dispute, this is not a water issue. It relates to the inalienable rights of Kashmiri people to self determination."[16]

Most recently, the Indus Waters Treaty was tested once again as both India and Pakistan considered new dam projects to meet rising energy demands. India is undertaking the Baglihar Hydropower Project (BHP) on the River Chenab in India, 160 kilometers north of Jammu, under severe opposition from Pakistan. Apart from objecting to the project design of the BHP, Pakistan has expressed opposition to the Tulbul navigation project, the Sawalkote Hydroelectric Project, and the Kishanganga Hydroelectric Project, all located in Jammu and Kashmir. The Baglihar dispute was taken to the World Bank, which appointed a neutral technical expert, Swiss engineer Raymond Lefitte, in August 2005 to make a binding decision on the case. Lefitte gave his ruling on the dispute in early 2007 and the matter was amicably settled, with both sides claiming victory.

In its strategic plan, Pakistan has proposed building a series of dams. The most significant of these are the Basha and Kalabagh dams (shown in Figure 1, along with the two existing Indus basin dams, Tarbela and Mangla).

[16] Mohdammad Sadiq, personal communication via email, November 12, 2007

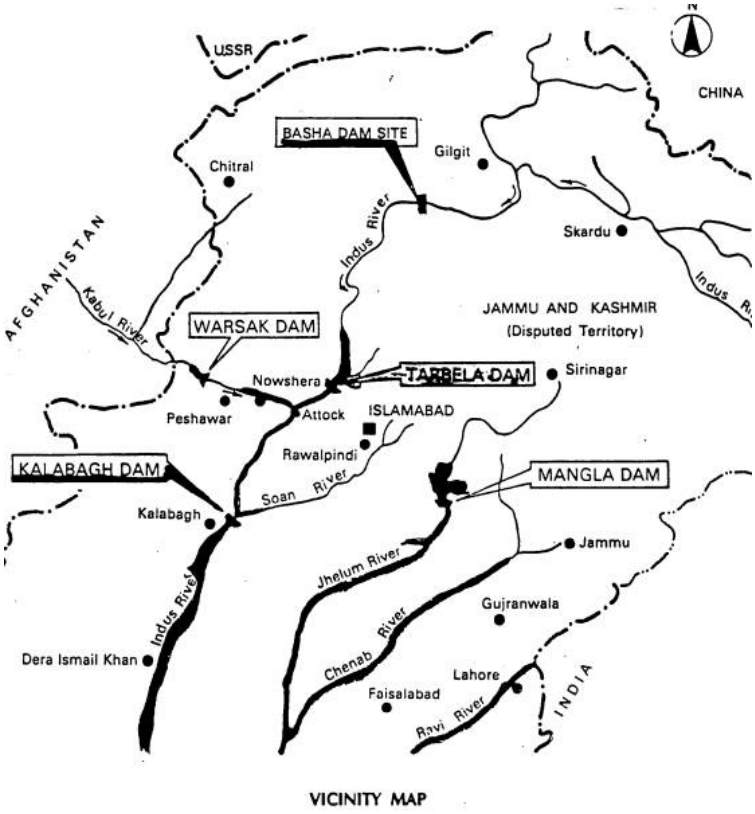

Figure 1: Basha and Kalabagh dam sites in relation to Indus basin dams in Pakistan

So far, the Indus Waters Treaty has served its specific purpose very well and has provided a direct avenue for regular, if technical, dialogue between the countries. It has not led to greater peacebuilding between the two countries. However, these most recent dam projects in Kashmir raise some potential prospects for using the agreement more instrumentally in resolving the Kashmir dispute. Increasingly, Kashmiri politicians are arguing that since the status of the territory is uncertain and so many of the disputes are in Kashmiri territory, they should be part of the Indus basin negotiations as well.[17] Whether such integrative solutions to the conflict would be found through cooperation on water remains to be seen.

[17] Personal Communication with Saleem Ali: Siraj Wahid, Vice Chancellor of the Islamic University of Kashmir, Toronto, United Nations mandated University for Peace meeting, May 16, 2006.

Table 1 summarizes some of the key lessons from this case:

Table 1: Policy lessons from the Indus basin case

Key policy issue	*Effects thus far*	*Future prospects*
Acceptability of technical solutions	Very effective in providing civil engineering solutions to dam siting and scale issues	Joint hydrological studies between Indian and Pakistani scientists to promote trust
Robustness of agreement in absence of trust	Withstood conflicts through regular mandated meetings and Indus Basin Commission constituted by technical experts and managers	Agreement likely to be a model for other bilateral agreements on fisheries, trade, and oil and gas pipelines
Role of external agent (World Bank)	Continuing support of dispute resolution system and water resource assistance strategies	Make such agreements part of regional development strategy for South Asia
Peace dividends for existing conflicts	Relatively few visible impacts on peacebuilding. Agreement relegated to mid-level technical exchange and management	Since river headwaters are in Kashmir, the agreement could be used as a conduit for the Kashmir dispute resolution process

5. The Sir Creek Dispute between India and Pakistan: Transforming a Multifaceted Water Conflict into a Cooperative Mechanism

One possible way to use the Indus Waters Treaty as a means of resolving larger disputes between India and Pakistan is exemplified by the case of the Sir Creek negotiations. Before falling into the Arabian Sea, the silt-laden waters of the Indus form a significant delta and develop creeks and channels along the coastal zone in close proximity to the border area between India and Pakistan. Sir Creek is the 17th and final tributary of the system, and the object of a dispute between India and Pakistan. The issue evolved around a 38-square kilometer estuary in the delta area south of the Rann of Kutch territory, which is on the border between the land and the adjacent sea belt. The area of dispute is just 6-7 square miles of land, but involves 250-300 square miles of ocean territory. The demarcation of the land border has a direct impact on the maritime boundaries of both countries, so there are both territorial and maritime dimensions to this dispute.

The creek area was a disputed territory between the ruler of Sindh and the Rao of Kutch in the latter half of the 19th century. When the dispute remained unresolved, the British government moved toward arbitration by a third party and asked the Government of Bombay to mediate a proposed solution.[18] The matter was settled by the Government of Bombay through a ruling that became the

[18] The Sir Creek Affairs: can we accelerate the resolution', Rear Admiral Ravi Vohra, Maritime Affairs, National Maritime Foundation, New Delhi, 2006, p.4.

basis of a map prepared in 1914 known as B-44. At present, the dispute revolves around differences in interpretation of this map.

In 1965, an armed clash occurred between India and Pakistan over the Rann of Kutch, followed by Pakistan's claim that half of the Rann was Pakistani territory along the 24th parallel. This was rejected by India on claims that the boundary ran roughly along the northern edge of the Rann. Both sides agreed to take the matter to the International Court of Justice (ICJ). The Indo-Pakistan Western Boundary Case Tribunal Award was given on February 19, 1968, and upheld India's claim, giving almost 90 percent of the territory to India and 5 percent to Pakistan.[19] Both parties agreed to exclude the line beyond border post 1175, and thus left the boundary undemarcated from Sir Creek's headwaters in the marshy lands of the Rann to the mouth in the Arabian Sea.[20] (See Figure 2.)

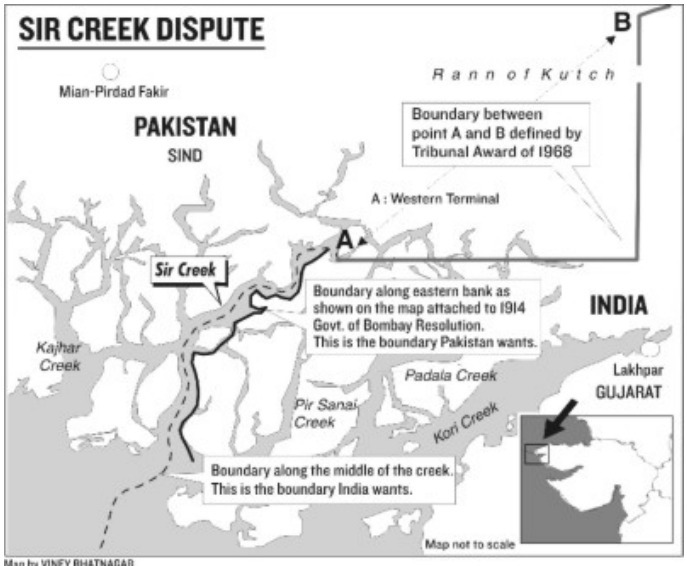

Figure 2[21]

At present, the dispute is over the demarcation of the border line in this creek area. The issue has great importance because it is where the present borders of Pakistan and India are supposed to meet each other south of the sensitive Rann of Kutch region, and because this is the point from which further demarcation of sea territories of both states would be made. At present, the Indian stance is that the creek is a navigable channel and so the international law of navigable water courses should be applied. India claims that the boundary should be along the

[19] A.G. Noorani, '*Easing the Indo-Pakistani Dialogue on Kashmir: Confidence Building Measures for the Siachen Glacier, Sir Creek and the Wular Barrage disputes'*, The Henry L .Stimson Center, Occasional Paper 16, April 1994, p. 26

[20] 'Legal Purview: Wullar Barrage, Siachen and Sir Creek', Ahmer Bilal Soofi, South Asia Journal, Free Media Foundation, (Lahore) January- March 2005, p. 94.

[21] Map, courtesy of Bharat Bhushan, 'Tulbal, Sir Creek and Siachen: Competitive Methodologies', *South Asian Journal (*Free Media Foundation, January-March 2005) p 113

middle of the creek, demarcated by using international law's doctrine of Talweg.[22] In contrast, Pakistan argues that the creek is non-navigable, as it is dry several months of the year. According to Pakistan's interpretation, the mid-channel principle cannot be applied to the boundary along Sir Creek, and the demarcation must lie along the eastern edge of the creek. Whether the creek is an annual or perennial source of water is thus the crux of the dispute. The seasonal water flow also has important implications for the wildlife in this area, as discussed later in this report.

Negotiations were stalled for 20 years, but accelerated in 2000, once Pakistan and India signed and ratified the Law of the Sea (LOS) Convention. The LOS Convention requires both sides to resolve their maritime disputes by submitting their claims over maritime territories. The initial deadline for resolution set forth by the convention was 2004, but it was extended to May 2009. The failure of the signatories to reach any understanding would invoke Part XV of the convention, which provides a comprehensive mechanism for dispute settlement or may also declare the unresolved maritime zones international waterways. According to a senior Pakistani negotiator, "India and Pakistan are under pressure of the Law of the Sea Convention, and both will resolve the Sir Creek issue. Let 2009 come closer, and this is going to be settled, because the Law of the Sea Convention is an effective machinery to accelerate the maritime dispute settlement process between India and Pakistan."[23] This statement reflects the importance that international treaties can have on forging cooperation at a micro-level between states. The potential for international environmental agreements to play such a role thus deserves greater attention.

Indian negotiator Vice- K.K.Nayayyar the former vice chief of Naval staff India has also expressed optimism about the resolution of the conflict, though he feels it first needs to be decoupled from other bilateral conflicts:

"The question that we need to be clear about is why is Sir Creek being linked to other issues? Why not resolve it as a stand alone issue? We need to remember that the creek is a water body and all water bodies change course with time depending on various factors. As we go further away from 1914 which was the last time a decision was taken on the creek the issue will become more complicated. A good decision in time is perhaps preferable when various factors are easily identifiable and comparatively simpler to resolve. I think the political decision on this is nearing its end point and I hope that this will become a good symbol of mutual confidence building."[24]

[22] For rivers the middle is the frontier in the case of non-navigable rivers. In the case of navigable rivers the deepest line of the main channel (Talweg) is the frontier. If the channel changes, the frontier changes with it. If the entire river changes its bed, the dry Talweg remains the boundary. For reference see, Warner Levi, '*Contemporary International Laws: a concise introduction'*, Westview press, Colorado, 1991, p.133.
[23] Commodore Zafaryab Khan, Director Pakistan Navy Civil Authority (PNCA) also the former Director Pakistan Navy Hydrographic department and the member of the Pakistan delegation participated in the negotiations on Sir Creek since 2000. Meeting with the author on October 23, 2007, Karachi.
[24] Personal communication with K.K. Nayyarar, via email, December 2, 2007.

Pakistan and India have concave coastlines and due to non-demarcation, neither is able to develop this area economically. They are also deprived of enormous sea resources and are unable to use their territorial waters, contiguous zone, continental shelf, or Exclusive Economic Zone in this particular sea area. The soil conditions of this region also need to be jointly monitored if any useful economic development is to occur on the terrestrial part of the dispute area. Maritime joint environmental monitoring is also essential to ensure the economic viability of the region, given the potential for oil spills and maritime accidents to damage the economic interests of both sides.

Pakistani President Musharraf and Indian Prime Minister Manmohan Singh met in Havana, Cuba, in September 2006 and agreed that neutral experts should meet immediately to plan a coordinated effort for a joint survey of Sir Creek and the adjoining area.[25] The two heads of state agreed on two points: a joint survey of the area based on modern technical information, and a joint survey team comprised of both Indian and Pakistani experts. As a result of the survey, the joint expert team installed pillars to identify measurements and collect data.

The two sides put forward different proposals for the resolution of the disputes, but each was rejected by the other party. India offered at least two significant proposals for the resolution of the problem. In 1998, it proposed that the boundary be delineated at the boundary seaward side commencing at the EEZ limit (See Figure 3). This proposal was rejected by Pakistan, as it would consider a maritime boundary only after the determination of a land boundary in Sir Creek, and argued that both issues should be addressed in a single agreement. According to negotiator Commodore Zafaryab Khan, "The demarcation of the maritime borders is not the real issue, as it can be resolved through the principles of international law; the real issue is the demarcation of land borders, and it should be addressed first."[26] A second proposal came in 2006, for a joint oil exploration venture in the creek area. Indian military admiral Ravi Vohra described the prospects as follows:

"Pakistan is producing oil and gas to the north of the Sir Creek. Similarly India too has gas and oil fields to the South of Sir Creek in the areas of Gujarat. The two sides may create a joint commission for management in oil and gas resources. Both sides may consider the sharing of cost of investment and also the profits on an equal or prorate basis. This will help both sides to work together in the energy security area and would be a win -win situation for both. The Sir Creek Affairs: can we accelerate the resolution."[27]

Pakistan also rejected this proposal, calling instead for arbitration, as it felt that joint ventures were only possible between two like-minded partners.

[25] 'All eyes on Sir Creek talks', Amit Baruah, The Hindu, May 13, 2007
[26] Comm Zafaryab, op.cit.
[27] Rear Admiral Ravi Vohra, Maritime Affairs, National Maritime Foundation, New Delhi, 2006, p 14

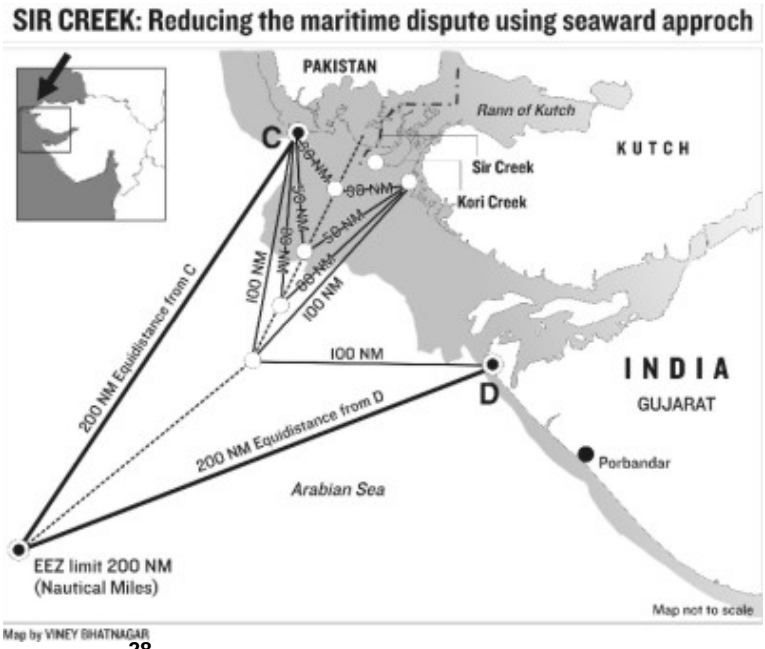

Figure 3[28]

India has thus far rejected Pakistan's attempt to internationalize the issue, either through arbitration or the involvement of any third party, on the grounds that the issue must be resolved bilaterally, in accordance with the Simla agreement.[29] The two sides accelerated the pace of negotiation after the start of a composite dialogue in 2004. The common stance regarding the use of a mediator has also been rejected by key negotiators who believe that "third parties are usually asked to get involved when the two disputed parties are not negotiating with each other, but here, both two sides are constantly in discussion and trying to sort out the problem with each other. Any third party cannot and will not be allowed to get itself involved."[30]

Yet despite India's reluctance on external mediation, senior Indian negotiators have hinted at potential linkage between the dispute and other issues of conflict: Indian Admiral J.G. Nadkarni wrote in a 2001 article on the topic that:

"Well wishers of both India and Pakistan who are trying to douse the fires in Kashmir and wants to establish better relations between the two countries may like to adopt the techniques of boundary control in tackling the issues…Our efforts should therefore be to try to limit the damage that Kashmir is causing to the two countries, economically, politically and militarily. The Indian Ocean offers a perfect place for boundary control. Why should we allow the problems on land to spread to the sea…the Arabian sea offers considerable scope of cooperation

[28] Map, courtesy of Bharat Bhushan, 'Tulbal, Sir Creek and Siachen: Competitive Methodologies', *South Asian Journal (*Free Media Foundation, January-March 2005) p 114.
[29], Sir Creek' talks failed Pakistan for arbitration, Indian Express, New Delhi, November 10, 1998.
[30] Commodore Zafaryab, op.cit.

between the two countries the will and determination to stop the spread of land problems on the sea agreement could easily be reached in demarcating the maritime boundaries, a more pragmatic and human method of dealing with fishermen, laying of oil pipe lines, avoiding incidents at sea, the two navies and cooperation in search and rescue."[31]

6. The Role of Regional Environmental Institutions

Even if a formal mediator is not appointed, it remains to be seen whether regional development institutions could play a role in resolving this dispute, as the World Bank did in the Indus basin case. Regional organizations like the South Asian Association for Regional Cooperation (SSARC) currently have a limited mandate to help with such political disputes, but their role could potentially be expanded. Indeed, the environment is being used as a critical point of linkage by SAARC to galvanize such change: The SAARC 14 summit meeting in April 2007 resolved to develop cross-border regional projects pertaining to four issues that affect their people's daily lives—water, energy, food, and the environment.[32] India has agreed to similar cooperation over marine environments under BIMSTEC,[33] which includes two members of SAARC, Bangladesh and Sri Lanka.[34]

The SAARC working group on maritime matters is restricted to unofficial levels, but according to one participant in this effort: "It at least provided a forum for discussing the issue, and in this manner, SAARC's role is positive."[35] SAARC, the only South Asian regional organization that claims both India and Pakistan as members, was founded with the idea of promoting regional cooperation, including economic growth, social progress, and cultural development, but its mandate thus far has excluded bilateral issues.

Given the SAARC resolution of April 2007, the organization may become active in maritime cooperation. Initially, SAARC might address marine environmental cooperation among the littoral states. This could be extended to cover coastal management. SAARC could also take up the task of creating a Center for

[31] Admiral J.G.Nadkarni,' Boundary control', rediff.com, December4, 2001, http://www.rediff.com/news/2001/dec/04nad.htm

[32] South Asia regional cooperation finally in sight, Praful Bidwai April 7, 2007,

[32]BIMSTEC (Bay of Bengal Initiative for Multi Sectoral Technical and Economic Cooperation) was established in June 1997 and included India, Thailand, Myanmar, Sri Lanka and Bangladesh as its members. Nepal and Bhutan were recently accepted as new members. Its aim is to enhance regional cooperation by economic links between countries in South and Southeast Asia. See Institute of Peace and Conflict Studies, New Delhi, Article 1346, March 19, 2004.

[34] The joint statement issued at the end of the 9th ministerial conference held at New Delhi on Aug 9, 2006, the members reiterated the commitments to step up our cooperation, including with our private sectors, to ensure the sustainable use of marine resources through effective conservation and management of the resources in the Bay of Bengal in accordance with international law.

[35] Capt. Tipu, Director, Pakistan Navy Hydrographic Department, Karachi.

Maritime Cooperation. The objective of the center would be maritime cooperation and dialogue among SAARC states and the promotion of maritime confidence- and security-building measures. The aims of the center would be to supervise security issues such as piracy, drug trafficking, terrorism, and offshore pollution control. The focus of the cooperation would be non-political, including issues such as environmental pollution, weather prediction, piracy, fisheries infringements, search and rescue, and narcotics trafficking.[36]

The non-demarcation of Sir Creek is causing serious environmental problems, so addressing various environmental issues could constitute the earliest step of cooperation. Although the environmental issues were never the concern of the two states to expedite the settlement process,[37] most diplomats continue to consider environmental factors external to the actual resolution of such disputes, when they might in fact be at the very core of both the perception of the conflict and its resolution. For example, the Pakistani foreign office spokesperson states that the government "is cognizant of the environmental problems facing the region, and concerned authorities are addressing the issues of environmental cleanliness of Indus delta. However, any regional cooperation will have to be contingent upon the resolution of the Sir Creek issue."[38]

Changing the strongly-held view that environmental factors are secondary to the resolution of such territorial, riparian, and maritime disputes requires a seminal shift in the way policymakers consider the connections between environmental factors and the structural underpinnings of disputes. Framing the deterioration of the environment as a common aversion is essential to achieving this shift. As an example of such an approach,

Box 1: Malé Declaration on Air Quality: describes the Malé Declaration, a South Asian air quality initiative

Air quality has often been considered the most truly global environmental problem because of the relative mobility of pollutants and the inability of technology to confine pollution within borders, as is possible with water by constructing impoundments. It is therefore not surprising that some of the major success stories in environmental management tend to be those focused on air quality, particularly when linked to human health concerns, such as the Montreal Protocol on ozone depletion. There is, however, considerable policy debate over how to handle point–source air pollution, such as what emanates from large industrial establishments and non-point-source pollution, where the number of emissions sources is dispersed widely within the population. In some cases, countries may be hesitant to curtail pollution from large industrial point sources, particularly when they are a source of energy, as with coal-powered plants. In

[36] Regional Maritime Cooperation Under the auspices of South Asian Association of Regional Cooperation, M. Khurshed Alam, BIIS Journal, Vol. 18, No.1 1997, pp32-6
[37] Capt.C.D Bhatti, op.cit.
[38] Mohammad Sadiq, op.cit.

other cases, enforcement of non-point and "fugitive" emissions remains the most perplexing challenge for governments.

On March 20, 1998, representatives of South Asian governments, including India, Pakistan, Bangladesh, Nepal, Sri Lanka, Bhutan, and the Maldives met for a policy dialogue meeting at the Asian Institute of Technology (AIT) in Bangkok, Thailand and agreed in principle to a draft of a South Asian Declaration on Control and Prevention of Air Pollution. The meeting was organized by the UNEP Environment Assessment Programme for Asia and Pacific (UNEP/EAP-AP) based at AIT, and the Stockholm Environment Institute (SEI), based in Stockholm, Sweden, as part of the Regional Air Pollution Program in Developing Countries, funded by the Swedish International Development Co-operation (SIDA) and managed by SEI.[39]

The draft declaration was put before the South Asian environmental ministers for the official declaration at the seventh meeting of the Governing Council of the South Asia Cooperative Environment Programme (SACEP) held on April 22, 1998 in Malé, in the Republic of Maldives. SACEP is an intergovernmental sub-regional organization, with objectives that include promoting cooperative activities in environmental protection and management that are beneficial to the member states, and providing resources for project implementation through donor assistance and project support.[40] The implementation of the agreement is coordinated by UNEP's Regional Resource Centre for Asia and the Pacific (RRC-AP).

The declaration aims to achieve intergovernmental cooperation to address the increasing threat of transboundary air pollution, including pollutant gases and acid deposition, on human health, ecosystem functions, and corrosion of materials. Apart from delineating the general principles of intergovernmental cooperation for air pollution abatement, the declaration sets up an institutional framework linking scientific research and policy formulation. The document also calls for the continuation of this process in stages, with mutual consultation, to draw up and implement national and regional action plans and protocols based on a fuller understanding of transboundary air pollution issues.

While the security implications of air pollution are perhaps not as starkly visible to countries as those of water scarcity, the lack of control countries have over air-sheds necessitates cooperation if the issue is to be adequately addressed. The Malé Declaration is a first step in forming an epistemic community around the threats poor air quality poses to regional health. Framing the matter in terms of diminished tourism revenues and reduced work productivity due to time lost coping with respiratory ailments might also bring the issue within more

[39] Descriptive material for this case is derived from the Regional Air Pollution Program in Developing Countries web site, based at York University (UK): http://www.york.ac.uk/inst/sei/rapidc2/rapidc.html. See also http://www.rrcap.unep.org/issues/air/maledec/baseline/indexpak.html for baseline data on each party.
[40] See http://www.sacep.org/default.htm for more on SACEP.

mainstream economic security concerns. Thus far, the cooperation resulting from the Malé Declaration has been primarily technical in nature, though ecological data-sharing can itself raise sensitivities of military security. In that respect, perhaps the willingness for countries to share information about emissions that would reveal the quality of coal being used for power generation and other related matters indicates a strengthening of ties. However, in order to achieve the full potential of environmental cooperation on air quality, all countries in the region will need to perceive the matter with as much urgency as water is perceived.

The increasing pollution levels along the Gulf of Kutch have been noted by numerous environmental organizations, including the World Wildlife Fund. Karachi industrial and sewage waste, which travels 100 kilometers south to this area, is one of the causes of increasing marine pollution. In addition, under the Pakistan National Drainage Program, the Left Bank Outfall Drain is pushed west to Karachi, toward coastal areas. Oil spills also do considerable harm to the marine environment. The July 2004 spill by the Greek tanker Tasman Spirit, which was carrying 60,000 tons of oil when it ran aground at the port of Karachi, resulted in the leakage of around 30,000 tons of crude oil over a 10-kilometer stretch of Pakistan's coastline and causing negative impacts on the Pakistani marine environment.

Some natural causes have multiplied the effects of the pollution—notably, extreme scarcity of freshwater due to low rainfall on the Pakistani side is disturbing the ecosystem. This was noted after research was conducted on the fish catch from the area and also on the decline in the number of some rare flamingo species in the area.[41] The Rann of Kutch was made famous because of the presence of a flamingo city in Sindalbet, which is estimated to have been home to around 30,000 flamingos in 1973.[42] The mangrove forests in the Indus Delta, and particularly the Kutch region, are shrinking at an alarming rate. The forest area has decreased from 263,000 hectares in 1977 to 158,599 hectares in 1990, a reduction of 38 percent.[43] The decrease in the coral reef presence has exposed the coastal belt to the erosion effects from frequent cyclones.[44] These coastal wetlands are natural filters that trap sediments and pollution present in

[41] A rare flamingo species *P.rubber* and *P.minor* population is declining as reflected from the species population count by the Sindh Wild life Department. For reference see Sindh Wild life Department Information Sheet on Ramsar Convention, September 2002.
[42] The Rann of Kutch was made famous by the great ornithologist Salim Ali, when he revealed the presence of the Flamingo City in Sindalbet. He wrote a book on the birds of Kutch. The Flamingo city was deserted as the bet was fully covered by salty water. Even then it is estimated to have around 30,000 flamingoes in 1973. See Dr. Surindar Singh, 'Border Management of India's land borders", Jammu and Kashmir, Trikuta Radiant publications, 2003, p. 202.
[43] Altaf Memon, "An overview of the history and impacts of the water issue in Pakistan', University of Maryland University College, Adelphi, Maryland, USA November 9 2002.
[44] Bharat Bhushan, 'Tulbal, Sir Creek and Siachen: Competitive Methodologies', *South Asian Journal (*Free Media Foundation, January-March 2005) pp 91-100.

surface runoff and the intertidal movement of water, thereby regulating phytoplankton growth and fish pollution in adjoining ocean regions.[45]

Cooperation over environmental protection could lead to political and security cooperation in this region. Not only is it very hard to draw a clear distinction between the marine environment and the adjacent land environment in this wetland area, but it is also impossible to differentiate between areas of Sindh (Pakistan) and of Gujarat (India) ecologically, thus providing an impetus for transboundary conservation efforts (Ali, 2007). Both Pakistan and India have signed the South Asia Seas Action Plan, arranged by UNEP, which required the parties to cooperate in crisis instances. Pakistan officially informed India of the Tasman Spirit oil spill on the Karachi coast in 2004, as the agreement dictated.

Furthermore, Karachi harbor received over 150 million gallons of un-treated industrial effluent daily. This causes pollution at the seaport and in coastal waters. In 1995 static shows that Pakistan generates 46920 tones of solid waste per day, out of which 19190 tones comes from urban areas and 27730 tones comes from the rural areas. The city of Karachi produces 250 mgt of sewerage and generates 3000-5000 tones of solid waste. Waste water flow from Karachi about 1,000 ml/d (222 mgd) at present. By the year 2025 it will increase up to 3,000 mld. Based on an average BOD strength of 400 mg/l, the total pollutant load is about 400 tones per day (t/d), increasing to over 1,200 t/d by the year 2025.Most of this waste water is discharge in to rivers without treatment, as a result river water turns to dark grey in color, high BOD, with low dissolved oxygen, moderately saline, high level of suspended solids and show hardness.[46] This highly polluted water drains in to mangrove swamps, salt bed and bay near the Sir Creek region. The major city´s waste water flows, through open drains and down nulls and rivers. The cumulative effects of these environmental problems cause a high incidence of water borne disease.

The absence of joint environmental management in this region is perhaps most acutely highlighted by the dispute's impact on fisheries and the communities that depend on them. It is estimated that just 30 percent of the total fish harvest in the Sir Creek region is currently exploited. Due to non-demarcation of the international maritime borders, the prospects for a sustainable fishery on both sides are also being compromised. There is considerable potential for developing the fisheries, particularly on the Pakistani side. In the year 2000-2002, total fish production from Pakistan was 665,000 metric tons, while marine fishes were 480, 000 metric tons and inland fisheries was 185,000 metric tones. Pakistan contains nearly 350 different species having commercial values, out of which 240 are commercial fish, 50 small pelagic, 10 medium size pelagic, 18 large pelagic, 15

[45] Ramsar Forum, for reference see, http://ces.iisc.ernet.in/hpg/envis/doc98html/ecowep99115.html
[46] Study of heavy metal-pollution Karachi and Gawadar coast', National Institute of Oceanography, September 2001, project # 50022801, p. 1-20. *Environmental Pollution in Sindh, Pakistan', Farzana Panhwar, September 2004,Source: www.eco-web.com/editorial/040924.htm*

species of shrimps, 12 of squid/cuttle fish/octopus and 5 lobsters species. At resent the fish production is 0.5 million metric tons.

Fishermen are often arrested and jailed for crossing the line, which is not demarcated, and then later released as a "confidence-building measure." Such exchanges of prisoners happened in 1991, in July 1997, and then on the eve of composite dialogue in November 2004.[47] The arrests of fishermen are in fact contrary to the LOS Convention, which forbids the detention of a crew for more than three days.

Such "goodwill gestures" are also present among other South Asian countries. For example, a significant achievement highlighted by SAARC was the amicable resolution of the problems caused by Sri Lankan fishermen poaching in Maldivian waters. The Sri Lankan government has gone to great lengths to educate Sri Lankan fishermen not to venture into Maldivian waters, and, in January 1997, Foreign Minister Jameel confirmed that there has been no poaching in recent times. The Maldives views this act as an example of great sensitivity shown by Sri Lanka in a spirit of "good neighborliness" to a serious concern of a neighbor.[48] India and Sri Lanka have also released each other's fishermen as goodwill gestures.[49]

The fishermen's union of Gujarat and Sindh proposed establishing a joint body to issue licenses for fishing in the area. It is also suggested that the limited-quantity joint fishing licenses may be issued along with photo identity cards issued by the coast guards and the fishermen's union jointly on either side. India has a similar agreement with Sri Lanka.[50]

The Kutch region was declared a wetland under the Ramsar Convention of 1971. Pakistan signed the convention in 1976 and India in 1982. Pakistan declared the Rann of Kutch area a Ramsar site in 2000. The Sir Creek area is part of the Rann of Kutch and very close to the declared wetland; therefore, the convention may be extended to this area as well. The issue could be addressed by the creation of a maritime peace park similar to the existing Red Sea Maritime Peace Park in the Gulf of Aqaba between Israel and Jordan, which was created under the peace treaty between those two countries. The Sir Creek maritime peace

[47] In 1997 both the countries exchange 194 imprisoned fishermen. Then in 2001 Pakistan released 84 India while India released 162 Pakistan fishermen. In 2004 India released 148 Pakistan fishermen and Pakistan released 155 Indian fishermen. The Hindu, November 6, 1998.

[48]'Maldives Sri Lanka and the India factor', R. Aryasinha (is a scholar and diplomat, presently Spokesman of the Sri Lankan Foreign Ministry). This article is an updated adaptation of an earlier one which appeared in the book, India's Relations with Her South Asian Neighbors Other than Sri Lanka, Colombo, BCIS/Swedeshi, 1992.

[49] 162 Indian fishermen repatriated from Sri Lanka to India and 18 Sri Lankan from India to Sri Lanka.. 'The Indi Coat Guard: A perspective', Vol. 52, No.3, 1-15 February 2005.
[50] Bharat Bhushan, op. cit.

park could be used for the development and protection of the coastal areas and the adjacent Rann of Kutch.

The creation of integrated ecosystem and coastal zone management is essential to meeting the changing ecological conditions in the region, as the South Asia Cooperative Sea Action Plan states.[51] The major aim of planning and execution should be to regulate fishing, aquaculture, pollution, coastal flooding, and erosion under a composite integrated coastal zone management program. This is also provided by the United Nations' Agenda 21 on sustainable development, which was incorporated by the revision of the Mediterranean Convention regime and the 1991 Antarctic Environmental Protocol. Focusing on the region's environmental issues may help the two countries bypass the political tension and conflicts between them and cooperate with one another. Box 2 provides some ideas that have emerged from consultations in the region with senior policymakers as well as civil society groups on how to reconfigure the Sir Creek dispute.

Box 2: Environmental Conflict Resolution Ideas for Sir Creek

1. *A Center for Maritime Cooperation would be an ideal collaborative point for all the SAARC countries, and would help energize SAARC. The objective would be non-political, including environmental protection and marine cooperation.*
2. *Environmental protection policies under Integrated Coastal Zone Management would be extremely important to dealing with the entire coastal belt.*
3. *The livelihood aspect of the issue could be addressed by having a joint fisheries management plan with clear training efforts on navigation and sustainable yield of fisheries.*
4. *The two sides could create a joint commission for effective environmental management of oil and gas resources. Both sides could consider sharing the cost of investment and the profits on an equal or prorated basis.*
5. *The issue could be treated by the creation of a maritime peace park similar to the existing Red Sea Maritime Peace Park in the Gulf of Aqaba between Israel and Jordan. The Sir Creek Maritime Peace Park could be used for the development and protection of the coastal areas and the adjacent Rann of Kutch.*
6. *Collaboration on conservation of rare wildlife such as indigenous flamingo species could be made through a joint endangered species agreement.*
7. *The existing Ramsar Convention could be extended to include the Sir Creek area, and could also provide the impetus for a resolution similar to what has been provided by the LOS Convention.*

[51] The South Asian Seas has been designated by the governing council of the UNEP as an area where the UNEP the South Asian States and the action plan could coordinate in the environmental protection with in the region. See Action plan for the Protection and management of the marine and coastal environment of the South Asian seas region. UNEP cite

While many of these ideas may at present seem impractical, due to the existing tensions between India and Pakistan, structures are beginning to emerge within regional institutions to allow for their implementation. The Indus Waters Agreement demonstrates that cooperation over even the most contentious distributional conflicts is possible as long as national leaders and international institutions invest political capital in moving forward with these ideas. The Sir Creek dispute also highlights the importance of understanding the ecosystem that is under dispute, as that can play a role in the economic development of the region.

7. Conclusions

Decreasing quantities of clean water and declining air quality increasingly threaten South Asian countries. By framing water and air pollution as common aversions, we may be able to foster cooperation between otherwise-antagonistic players. There are also serious security concerns arising from unresolved territorial and maritime disputes. The non-demarcation of the sea coast has also made that region an easy point of entry for smuggling narcotics, small arms, light weapons, and contraband; the area is home to many illegal non-state actors engaged in criminal and terrorist activities.[52] Drawing the boundary would ameliorate regional security and reduce the threat of armed conflict, while also reversing the environmental degradation that could lead to endemic vulnerability and scarcity-induced disputes.

The Indus Waters Treaty is an example of how environmental cooperation can exist even during times of intense suspicion and armed confrontation between two nations. While the instrumental use of such cooperation in resolving larger territorial disputes remains questionable, there is no doubt that cooperation on environmental issues can improve relations between scientists from different countries. Initiatives such as the Malé Declaration that promote the sharing of environmental knowledge are indeed positive signs that the countries in the Indian Ocean basin are beginning to transcend the paranoia of the old security discourse that prevented the sharing of technical information. Instead, we are beginning to see signs of an emerging eco-regional approach to resource management that augurs well for improving the security of the SAARC countries.

These efforts seek to guide researchers and policymakers as they navigate the gaps in our understanding of the complex set of connections that tie environment, conflict, and cooperation. To extricate the issues in question, scholars and practitioners need empirical data, multi-level analysis, interdisciplinary cooperation, and integrated assessments of lasting cooperative mechanisms. This preliminary assessment of the South Asian region suggests that we can build the tools that could help sever the bonds linking environmental

[52] Ayesha Siddiqa Agha, *Maritime Cooperation between India and Pakistan: Building Confidence at Sea'*, Sandia National Laboratories November 2000, occasional paper 18.

conditions to violent conflict, while using mutual dependency on environmental resources as a pathway to confidence-building and cooperation.

References

Alam, Undala. 2002. Questioning the water wars rationale: a case study of the Indus Waters Treaty. *Geographical Journal.* 168: 341-353.

Ali, Saleem H. ed. 2007. *Peace Parks: Conservation and Conflict Resolution.* Cambridge MA: MIT Press.

Ali, Saleem H. 2003. Environmental planning and cooperative behavior. *Journal of Planning Education and Research* 23:165-176.

Axelrod Robert. 1997. *The Complexity of Cooperation*. Princeton NJ: Princeton University Press.

Axelrod Robert. 1985. The Evolution of Cooperation. New York NY: Basic Books.

Bose, Sugata. 2006. *A Hundred Horizons: The Indian Ocean in the Age of Global Empire.* Cambridge MA: Harvard University Press.

Conca, Ken. 2005. Governing *Water: Contentious Transnational Politics and Global Institution-building*. Cambridge MA: MIT Press.

Conca, Ken, and Geoffrey D. Dabelko. 2002. *Environmental peacemaking*. Baltimore, MD: Johns Hopkins University Press.

Crisis Management Initiative. 2006. *The Aceh Negotiations:* Online resource compendium (Helsinki Finland): http://www.cmi.fi/?content=aceh_project

De Boer, Jelle Zeilinga. 2004. *Earthquakes in Human History : The Far-Reaching Effects of Seismic Disruption.* Princeton NJ: Princeton University Press.

The Economist. 2005. Missed chances after the tsunami. February 26.

Frerks, Georg and Bart Klems 2005. *Tsunami Response in Sri Lanka.* Netherlands: Waginingern University and Clingendael Institute.

Fuwa, Yoshitaro. 2003. Natural Resource Management from a Conflict Resolution Perspective. *Japan Bank for International Cooperation Review,* Vol. 8 (November).

Græger N. 2000. Environmental Security. *Journal of Peace Research.* 33(1): 109-116.

Haas, Peter. 1992. *Saving the mediterranean: The politics of international environmental cooperation.* New York, NY: Columbia University Press.

Hakim, Iftikhar A. 2005. *The Indus Waters Treaty: an institutional mechanism for addressing regional disparity.* UCLA, Department of Urban Planning, Masters thesis.

Hicks, W. K. et al. 2001. Development of the regional policy process for air pollution in South Asia, southern Africa and Latin America. *Water Air and Soil Pollution* 130(1-4): 211-216.

Homer-Dixon, Thomas. 1998. *The Environment, scarcity and violence.* Princeton NJ: Princeton University Press.

Hussain, Syed Shahid 2005. 'India's River linking Plans, *South Asia Journal,* Free Media Foundation, (Lahore) January- March 2005, p. 132

International Crisis Group. 2006. *Aceh: Now for the Hard Part.* Briefing, Area Briefing No. 48. March 26

Jha, Raghbindera. 2005. Alleviating Environmental Degradation in the Asia-Pacific Region: International cooperation and the role of issue-linkage. Australian National University Working paper.

Kelman, I. 2005. Tsunami diplomacy. *Sociological Research.* 10 (1): April 7.

Lonergan, Steve and Geoffrey D. Dabelko. 2005. "The United Nations and Environment, Conflict, and Cooperation." 2004. Nairobi: Heinrich Boell Foundation.

Lowi, Miriam. 1995. *Water and power; The politics of a scarce resource in the Jordan Basin.* Cambridge UK: Cambridge University Press.

Malik, Bashir A. 2005. *The Indus waters treaty in retrospect.* Lahore, Pakistan: Brite Books.

Najam, Adil. 2003. "The human dimensions of environmental security: Some insights from South Asia." *Environmental Change and Security Project Report 9*, 59-73.

Pirages Dennis, Cousins Ken eds. 2005. *From Resource scarcity to Ecological Security: Exploring New Limits to Growth.* Cambridge MA: MIT Press.

Park, Jeffrey et al. 2005. "Performance review of the global seismographic network for the Andaman-Sumatran megathrust earthquake." *Seismological Research Letter,* Vol. 76, No. 3.

Samaddara, Ranabira and Helmut Reifeld. 2001. Peace as process: reconciliation and conflict resolution in South Asia. New Delhi: Manohar publishers.

Schiff, Maurice and L. Alan Winters. 2002. *Regional Cooperation, and the Role of International Organizations and Regional Integration.* Washington: World Bank Policy Research Paper 2872.

Shand, Ric and K.P. Kalirajan. 1997. Yamazawa's open economic association: An Indian Ocean Grouping for Economic Cooperation. *The Developing Economies*, Vol. 35.

Siddiqui, Toufiq (2004). *An India-Pakistan Détente.* Honolulu, Hawaii: East-West Center, Analysis Report No. 75.

Stein, Arthur. 1993. *Why Nations Cooperate?* Ithaca, NY: Cornell University Press.

United Nations Environment Programme. 2004. Understanding Environment, Cooperation and Conflict. Washington DC: Woodrow Wilson Center and Nairobi, Kenya: UNEP. Available online at: http://www.unep.org/pdf/ECC.pdf.

Uyangoda, J. 2005. Ethnic conflict, the state and the tsunami disaster in Sri Lanka. *Inter-Asia Cultural Studies* 6(3): 341-352.

World Bank 2005. *Pakistan's Water Resource Assistance Strategy.* Washington DC: World Bank Report PK-34081.