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"BEYOND KARGIL: THE TECHNOLOGY OF PEACE IN INDIA - PAKISTAN
BORDER RELATIONS"

by

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Introduction

The potential for cooperation between India and Pakistan is substantial. Topics as widely varying as national security, the environment and trade hold the potential for improved bilateral relations. This paper looks at a few areas in which monitoring technology could contribute to enhancing cooperative border agreements between the two nations. The goal of the paper is not to provide prescriptive solutions to regional problems but to expand the number of options being considered for improving Indian-Pakistani relations. Many of the impediments to bilateral progress are a result of a history of conflict and mistrust. By utilizing technical monitoring and inspections, each side can begin to replace suspicion and doubt with knowledge and information useful in making informed political, economic and military decisions. At the same time, technical monitoring and inspections can build confidence through common interactions.

India and Pakistan have pledged to resolve their disputes, including Kashmir, through dialogue. Implementation of that pledge is influenced by a number of factors, including changes in the political systems and the fortunes of the leadership. Events of the past year and a half have severely tested these two governments' ability to move forward along a constructive and positive path. Testing of new missile systems both preceded and followed testing of nuclear weapons in May 1998. Both countries disregarded subsequent international displeasure as they proceeded to openly declare their respective nuclear capability. Their brief engagement with each other in February 1999 and movement toward a rapprochement diluted international condemnation of their nuclear activity.³ Within a recent period of nine months however, progress in the dialogue has been stalled first by the Pakistani move in Kashmir in May 1999, then by the Indian election in the summer of 1999 and most recently by the military coup in Pakistan.

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³ Pratap Bhanu Mehta, "India: The Nuclear Politics of Self-Esteem", Current History, Vol. 97, No. 623 (December 1998), pp 403-6.

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Despite these delays, both countries have little choice but to engage with each other in order to try to find common approaches to some of their mutual problems. The costs of continued conflict are simply too high. Even after the Kargil conflict in May, leaders of both countries talked about resuming a dialogue. Former Pakistani Prime Minister Nawaz Sharif stated in his speech to the nation on July 12, 1999⁴ that dialogue was critical. On July 14, 1999, Indian Prime Minister Vajpayee reaffirmed the Lahore process, committing to bilateral resolution of conflicts. He noted that India and Pakistan have to continue to deal with each other because "you cannot change geography".⁵ Following his reelection in October, Vajpayee repeated that pledge. While the military coup in Pakistan made India less willing to talk, in his first detailed address after assuming power, General Pervez Musharraf vowed that Pakistan wanted good relations with India and desired peaceful borders with its larger neighbor.⁶

As the Kargil conflict demonstrated, stability along the Line of Control (LOC) that runs through Kashmir is critical for peace between India and Pakistan. We offer here an approach to the management of border problems, which, if left unchecked, can lead to war. This approach is to use jointly operated monitoring technology both as a catalyst to accelerate the process of achieving political agreements and as a means for monitoring compliance with such agreements when they are reached. Technology is obviously not a substitute for political will. However, given political will, technology can help bridge the gap between stated intentions and implementation. It can also help increase mutual trust.

Background

The history of Ind0-Pakistan relations reflects the fact that India and Pakistan have worked to establish confidence-building measures (CBMs) even through prolonged periods of poor relations. In deed, India and Pakistan attempted to resolve various issues and build confidence long before the term confidence-building measure gained currency. This background traces examples of engagement and cooperation that have occurred despite a history of conflict. It provides encouragement that creative approaches may successfully begin to address the most contentious of the current border issues.

The early period, 1947-54

This period represented one where many of the issues left over from the partition of the subcontinent needed resolution. Primary among these was the division of Kashmir and the boundary disputes that remain today along the Line of Control (LOC) and the Siachen region. Although Pakistan nursed a sense of grievance that some of the items dealing with the division of assets belonging to the British central government of India were not fairly divided, the process moved forward. The turmoil of partition, with its attendant loss of life and shifting of nearly six million people across the new frontiers, was a traumatic

⁴ Ihtasham ul Haque, "Withdrawal Aimed at Diplomatic Solution: Talks Offer to Delhi to Ease Tensions, PM", Dawn, July 13, 1999.

⁵ Jaideep Sareen, "Pak Will Have to Initiate Dialogue Says Vajpayee", The Hindustan Times, July 15, 1999.

⁶ Text of General Musharraf's Speech, Dawn, October 18, 1999.

event. Despite the tense atmosphere of the time, many matters were settled. Both governments kept lines of communication open and there was a very professional interaction between the leadership of the two countries. Division of financial and military assets as well as exchange of evacuee property were important elements in early interaction and agreement. Movement of people by air, sea and land was relatively easy between the two countries throughout this period.

The second phase, 1955-1965

The quality of the interaction changed as India became a founding member of the non-aligned movement and Pakistan joined two US sponsored pacts, SEATO and CENTO⁷. Pakistan began searching for a more dynamic foreign policy after 1959. Ties with China and relations with the Soviet Union were cultivated. Pakistan launched an ambitious development plan, which recognized that a resolution to the Indus waters problem was critical. India and Pakistan became, in a sense, competitors on the global stage, even though there was no match in the size and economic base of the two.

The Inter-Dominion Accord of May 4, 1948 had divided the waters of the Indus River--the lifeline of West Pakistan. Under this arrangement, Pakistan paid India for the water released. Given that the Indus originated in India, Pakistanis feared that control over the waters of the Indus and its tributaries gave India a real hold on Pakistan. Neither side seemed willing to compromise although they continued to meet and discuss the issue.

David Lilienthal, a former head of the Tennessee Valley Authority and the US Atomic Energy Commission, saw the possibilities of a potential agreement between India and Pakistan on the division of the waters of the Indus and proposed a program to jointly develop and operate the Indus Basin river system. The World Bank, which was keenly interested in the development of both countries and perceived that the water dispute hindered economic progress, agreed to underwrite the deal. It was a bold and imaginative undertaking for the Bank.

The new framework provided for a series of dams and irrigation canals. It also divided the tributaries of the river Indus, awarding the eastern tributaries to India and the western ones to Pakistan. Careful arrangements were made to build canals and storage dams to divert waters from the western rivers and to replace the supply lost to Pakistan from the eastern rivers. India and Pakistan worked with the World Bank and its appointed engineers to fashion an agreement that did not rely on the principle of historical usage of the waters of the Indus basin but instead found some equitable way of resolving the issue on a permanent basis. It was a singular achievement and the resulting treaty signed by Indian Prime Minister Jawaharlal Nehru and Pakistani President Ayub Khan on September 19, 1960 in Karachi represented a significant confidence-building achievement for both sides.⁸

⁷ Southeast Asia Treaty Organization; Central Treaty Organization.

⁸ Henry L. Stimson Center, "Indus Waters Treaty: A History", Confidence-Building Measures Project, Washington DC, 1993.

The Sino-Indian border war of October 1962 was accompanied by US attempts to bring Indian and Pakistani leaders into discussion on the issues that divided them. President John F. Kennedy dispatched a special emissary to the subcontinent to explain to Pakistan why cooperation with India was a good idea and to India to see whether there was any possibility of movement on Kashmir. There was no change on Kashmir but the failed attempt convinced some within Pakistan that closer ties to China were important to Pakistan's future security. The hawks on Kashmir within the Ayub cabinet, Foreign Minister Z.A. Bhutto foremost amongst them, wanted a resolution on Kashmir that favored Pakistan. Consequently, they spearheaded the campaign to infiltrate the cease-fire line in Kashmir, leading India to attack across the international border.

The period 1965-71

The 1965 war between India and Pakistan wound down after less than three weeks but the effects continued much longer. Nonetheless, the two governments once again reached out to each other as travel was restored and limited trade resumed. The first "hotline" between India and Pakistan was established in the aftermath of the 1965 war. It put the directors general of military operations in touch for the first time, with the aim of preventing the type of situations that led to the 1965 war.

India continued to be a major player within the ranks of the non-aligned. Pakistan used the 1966-70 period for aggressive economic development providing impressive annual growth rates of over 6 per cent. India's development was moving apace and its foreign policy, coupled with growing economic strength, shifted the focus of the two countries away from each other.

When the focus on one another returned, it was once again in the negative sense with yet another war in 1971. A defeated and truncated Pakistan seemed exhausted. Yet, in early July 1972, the prime ministers of India and Pakistan met at Simla, to review the situation after the 1971 war. They arranged a framework for their future relations and provided for an end to hostilities through which India returned 90,000 Pakistani prisoners of war and territory captured on the western front in 1971.

The period 1972-1984

The question of building confidence was made more complicated by the reality of a truncated Pakistan. Consequently, Pakistan sought to separate its destiny from that of India through a deliberate westward turn towards the Persian Gulf region. The 1973 oil price increase provided greater resources to the countries of the Gulf. Pakistan benefited from their largesse even as it understood that a large and powerful India was the fundamental reality in the subcontinent.

Just as a two-front war had not been a welcome scenario for India in 1962 when border war broke out with China, the Soviet invasion of Afghanistan greatly worried the US and Pakistan in terms of potential trouble on the border with India. India and Pakistan reached out to examine their relations and to find points of agreement where possible. Starting in 1984, specific ideas for better relations were put forward and some were implemented.

For example, an Indo-Pakistan Joint Commission was set up under the aegis of the two Foreign Ministers. A variety of sub-commissions dealing with trade, tourism, travel etc. met prior to the biannual foreign ministers meetings. These institutions routinely exchanged views for the more than four years that they met. In addition to these specific bilateral contacts, the two foreign ministers, and often the leaders, met along the margins of the UN meetings of the General Assembly each autumn. Furthermore, the regional interaction under the South Asia Association for Regional Cooperation (SAARC) launched in Dhaka in 1984 provided yet another venue for talk of cooperation and the establishing of a modest agenda for collaboration.

The Period 1985-94

The positive interactions of the 1980s helped buffer the downturn in relations that came with the Brasstacks military exercises by India in 1986-87 and the Pakistani response.⁹ Key elements of confidence building emerged during this decade. For example, the Agreement on the Prohibition of Attack Against Nuclear Installations and Facilities was signed on December 31, 1988, in Islamabad between the two foreign secretaries, but approved by Prime Minister Rajiv Gandhi and Prime Minister Benazir Bhutto. That accord was needed in view of the growing nuclear capability of both countries; each understood any attack on a nuclear facility meant general war. Other agreements followed. On April 6, 1991 India and Pakistan agreed on Advance Notice on Military Exercises, Maneuvers and Troop Movement. That deal was a result of the near war conditions that large-scale military exercises had nearly caused in 1986-87. A concurrent deal was the Agreement on Prevention of Airspace Violations and another for Permitting Overflights and Landing by Military Aircraft. Given the ease with which the borders could unintentionally be violated by aircraft, the agreement sought to provide a buffer against violations of airspace and resultant automatic escalation of tensions.

Control over the production and use of chemical weapons provided another area of confidence building in the late 1980s. The potential for agreement was enhanced due to the absence of the political baggage that accompanied the nuclear issue. The use of such weapons in the Iran-Iraq war and the havoc that the weapons wrought were then fresh in the minds of regional countries. After extensive discussions, India and Pakistan signed a brief but comprehensive joint declaration on the Complete Prohibition of Chemical Weapons on August 19, 1992.

In the joint declaration, both nations pledged that they would become original state parties to the proposed Chemical Weapons Convention, which they did when the treaty went into effect on April 29, 1997. Both countries explicitly acknowledged the role of confidence building measures in promoting friendly bilateral relations based on mutual trust and

⁹ These large scale military exercises were held in 1986-87. The massive size of the forces involved and its location in an area below the traditional route in the Punjab along with the length of the exercise alarmed the Pakistan government. In response, Pakistan staged the "Saf Shikan" exercises on the Pakistan side of the Rajasthan border where the Indian forces were exercising. A war like situation was created between the two countries as a result of the massing of troops and equipment. Political leaders managed to lower tensions after a few anxious weeks.

goodwill. They declared they would eschew the development, production, acquisition, stockpiling and use of chemical weapons.¹⁰

Thus, even as the relationship between India and Pakistan continued on a less than perfect trajectory, the two nations moved forward on a variety of CBMs, despite the continued debate in both countries on the sequencing of any agreement. Disagreement revolved around whether Kashmir should be resolved first (as many in Pakistan wanted) or whether other agreements, such as the Indian preference for strengthened economic interaction through trade, should be put in place.

The Recent Period, Post 1994

The period began as Pakistan suspended foreign secretary talks with India, citing Indian actions in Kashmir and the absence of any solution to the disagreements there. However, other interactions continued. SAARC summits provided for interaction between the heads of government and an opportunity for the foreign ministers to meet. There were also the opportunities for the two prime ministers and senior officials to meet in various multi-lateral meetings.

India and Pakistan continued some level of functional agreements even in the absence of overall political agreement. For example, in the mid-1990s, both cooperated in a variety of measures aimed at reducing the trafficking of drugs and control of smuggling. Additionally, there was a good deal of cooperation in dealing with a large infestation of locusts in the Rajasthan/Sind/Southern Punjab areas during 1996-97. Experts were able to share data and cooperate in cross-border activities to eradicate the menace.

In this spirit of searching for common points of agreement, some areas were particularly singled out. The possibility of potential sale of excess electricity from Pakistan to India is one important area. Energy and environment issues looked promising for collaboration. Issues related to the building of a joint natural gas pipeline through Pakistan to the energy deficient areas of western India were discussed. Sourcing and financing were two important components that required further consideration. In addition, there were issues relating to security of supply for gas which would have to flow through Pakistan to India. Informal meetings that involved some of the crucial constituencies met in Rajasthan in order to examine the possibilities of constructing a secure supply regime.¹¹

When the foreign secretaries of India and Pakistan met in Islamabad in June 1997 to find ways of improving the relationship, they considered the idea of putting energy issues on the official agenda. However, eventually this category was left out as a result of Pakistani reluctance to move forward too fast on economic areas without commensurate movement

¹⁰ For the full text of this and some of the other India - Pakistan agreements, see, Michael Krepon and Amit Sevak, Editors, Crisis Prevention, Confidence Building, and Reconciliation in South Asia, New York: St. Martin's Press, 1995.

¹¹ Toufiq A. Siddiqi and Shirin Tahir-Kheli, "Cooperation in South Asia Through Collaboration in Energy and Environment", Report, United Nations Development Programme, 1997.

on Kashmir. It was during these talks that the approach of including discussion on a broad range of issues was revived.¹²

Despite political fall-out relating to differences over the exact nature of the agreements and what they meant to both parties, discussions on finding ways to cooperate in the energy sector continued to move forward. Pakistan said that its excess electric capacity was limited in quantity and available for a limited period of time, 5-8 years at most. Some senior Pakistanis worried that failure to understand the temporary nature of the agreement could have repercussions down the road. Yet the dialogue continued. Finally, in 1998, both countries agreed that they would negotiate the sale of the excess electricity from Pakistan to India. Technical discussions to lay out the potential arrangements went well. There were expectations that the thorny issue of tariff could be finalized in 1999.¹³

Thus, as the previous background indicates, throughout the past fifty years, India and Pakistan have selectively developed procedures for cooperation with each other, even in the face of major disagreements.

The Lahore Declaration

Major conflict between India and Pakistan occurred as late as the period between May and July 1999 high in the mountains of Kashmir along the LOC in Kargil. Yet, just months earlier, the Lahore Declaration was signed at the end of the visit of Prime Minister Atal Behari Vajpayee to Lahore on February 20-21, 1999. The declaration was meant to provide a new and ambitious road map toward a different and more productive peace between India and Pakistan. Lahore implied that conflict was no longer an option and that "an environment of peace and security is in the supreme national interest of both sides and that the resolution of all outstanding issues, including Jammu and Kashmir, is essential".¹⁴

¹² Specifically, the two foreign secretaries agreed to the cessation of hostile propaganda against each other and to set up a mechanism to address all of the following issues in an integrated manner. The areas for the composite dialogue comprise the following: Peace and Security, including CBMs; Jammu and Kashmir; Siachen; Wular Barrage Project / Tulbul Navigation Project; Sir Creek; Terrorism and Drug-Trafficking; Economic and Commercial Cooperation; Promotion of Friendly Ties in Various Fields. This framework remains in force even though meetings were suspended after the November round for some of the issues that was held in Delhi. Political uncertainties and the fall of the Vajpayee government delayed the next round slated for Islamabad.

¹³ One of the issues was the speed with which the agreement for the transmission of electricity could be implemented as there is no common electric grid between India and Pakistan. That issue was resolved to the satisfaction of both parties. Tariff remains a harder issue as Pakistani costs for the production of electricity are higher than acceptable to India. These costs are due to the higher costs that Pakistan originally negotiated with the independent power project (IPP) owners who would supply the electricity. The Pakistani government now hopes to re-negotiate the costs with the IPPs. However, the matter is even more involved as some of the projects with the excess capacity, e.g. HUBCO, involve World Bank guarantees (unusual in and of themselves) and the Bank is putting pressure on the government of Pakistan to quickly resolve the matter. In view of the critical financial support that is needed by Pakistan, expectations are that the matter will be resolved. Once that happens, the excess capacity will be available for export to India, when the tariff arrangement is worked out.

¹⁴ Memorandum of Understanding signed by the Indian Foreign Secretary K. Ragunath and the Pakistan Foreign Secretary, Shamshad Ahmad, Lahore, February 21, 1999.

The significance of the Lahore Declaration, and indeed the entire process launched with the "bus diplomacy", was the new recognition of the need for a different set of priorities in relations between the two countries. The Indian Prime Minister put an end to the recurrent theme in Pakistan that India did not accept the creation of Pakistan and wanted to undo partition through his visit to the Minar-e-Pakistan, which celebrates the birth of the idea of Pakistan and later its establishment. Even as political opposition contested the Vajpayee visit to Lahore, the two leaders were committed to the process they launched. They signed on to future bilateral consultations on confidence building measures in the nuclear and conventional areas aimed at conflict avoidance. Topics included: notification of ballistic missile flight tests, reduction of risks of accidental or unauthorized use of nuclear weapons; continued unilateral moratorium on nuclear testing; safety of navigation measures; and upgrading of military communication links between the two sides.

Absence of political will has often been lamented by all who wonder why agreements are so hard to reach between India and Pakistan. Thus, the Lahore meeting was celebrated by the two leaders and also by those outside the subcontinent who praised the effort as demonstration of political will for better relations and a new attempt to address and resolve old problems. The welcome message from the Indian leader was:

There can be no greater legacy that we can leave behind than to do away with mistrust, to abjure and eliminate conflict, to erect an edifice of durable peace, amity, harmony, and co-operation.¹⁵

The Lahore process set a timetable for dialogue with a number of milestones, including meetings of the foreign secretaries slated for April. There were even reports that Nawaz Sharif would travel to India on an accelerated schedule. Everyone expected him to receive a warm welcome in India even though it was clear that some of the problems between the two countries, such as Kashmir, were fundamentally difficult to resolve in a short time frame.

Domestic problems through March and April 1999 delayed the Indian side from moving forward quickly along the lines set up in Lahore. With the fall of the Vajpayee government and the elections scheduled for September - October 1999, expectations shifted to later in the year for any real movement on Indo-Pakistan relations. No matter how committed the Vajpayee government was to the Lahore process, its ability to move forward was restricted by its caretaker status. The emergence of the second term of Prime Minister Vajpayee offers another chance for dialogue with Pakistan, unless the military takeover in Pakistan continues current Indian unwillingness to move toward further dialogue.

While analysts will debate for a long time whether India and Pakistan came close to a full-scale war in the summer of 1999,¹⁶ events throughout June looked extremely serious.

¹⁵ Text of Prime Minister Atal Behari Vajpayee Speech, Lahore, February 21, 1999.

¹⁶ Similar debates occurred in 1987 after major military exercises triggered a crisis and in 1990 when both India and Pakistan said war was not imminent but US officials felt it was. After the 1990 crisis deputy national security advisor, Robert Gates was dispatched to India and to Pakistan to defuse the situation. See

Two nuclear powers were clashing in an area claimed by both sides. The potential role of nuclear weapons in such conflicts was openly discussed and some Pakistani officials referred to their country's nuclear capability as providing the weapon of last resort in case of Indian actions to widen the war. Neither country sought all-out war and both said that they continue to support the Lahore process of dialogue. Yet, as tensions mounted after the discovery of intruders on the Indian side in May and the shooting down of an Indian MIG-21 by Pakistan on May 27 1999, war seemed imminent.

Can future Kargils, with their tendency to derail relations, be prevented? We believe so. Vigilance is necessary and we offer a variety of ways in which the use of appropriate technology can assist the political leadership in their task.

Cooperative Monitoring for India/Pakistan Border Applications

As India and Pakistan seek a better relationship along their common boundary, there is a need to characterize the differences along that boundary, both physically and politically, and to consider specific monitoring options to address issues of concern. For purposes of this discussion, six distinct zones are defined. These are the Siachen Glacier region, the Line of Control (LOC) in Kashmir, the "working boundary", the recognized international border, the Sir Creek disputed region and the maritime boundary. The sections that follow describe these boundary regions and outline monitoring provisions that could enable or sustain boundary agreements between India and Pakistan separately for each zone or collectively along the entire boundary.

Siachen

At the northern extreme, India and Pakistan face off along the Saltoro mountain range in an area named for its most prominent feature, the Siachen Glacier. Since 1984 the two nations have battled over a 2500-square-km triangle of contested territory. The dispute arose over differing interpretations of a provision of the 1949 cease-fire, as well as subsequent 1972 Simla agreement, that left a portion of the cease-fire line in Kashmir undefined. The boundary was to proceed from map coordinate NJ9842 "thence north to the glaciers". This left a distance of about 65 km to the north undemarcated.¹⁷ The area remained undemarcated until 1984, when Indian troops occupied the watershed line along the Saltoro range northwesterly from NJ9842. Pakistan laid claim to a line from NJ9842 northeasterly to the Karakoram Pass on the Chinese border. For the past 15 years, armed conflict has ensued along this "line of contact". Figure 1 shows a composite satellite image of the Siachen region that highlights the area of dispute. The area is among the highest in the world and is characterized by mountain altitudes of over 7,500 meters and troop deployments at altitudes up to 6,700 meters. Not far away is K2, the second highest mountain in the world at over 8,500 meters.

Seymour M. Hersh, "On the Nuclear Edge", *The New Yorker*, March 29, 1993. There was even greater concern in the international community in the June 1999 crisis, after the overt nuclearization of South Asia. Fear of a nuclear war kept attention focused on de-escalation.

¹⁷ "Siachen: A solution being sought for the third time", *The Hindustan Times*, Nov. 6, 1998.

A political settlement of the Siachen dispute would include increasingly comprehensive provisions for de-escalation, disengagement and demilitarization.¹⁸ In addition to national means of verification, compliance determination would be enhanced through efforts at bilateral cooperation in monitoring. Because of the large area, difficult terrain, and harsh climate, Siachen presents unique monitoring challenges. Monitoring efforts must detect and identify the presence or absence of troops and military equipment deployed in and around the Siachen area. Initial determinations are possible through declarations and notifications supplemented with periodic inspections of deployment locations. As confidence is developed, the addition of ground-based monitoring technologies can provide a continuous assessment of relevant activities. Deployment of radars mounted near critical peaks or passes would also detect ground or aerial activities in the region.¹⁹ Video monitoring can supplement other sensors by characterizing the nature of the activities. An example can be seen in Figure 2 that shows an internet camera image from an Australian base in the Antarctic, a similarly harsh environment.²⁰

In order to provide broad area coverage of the remote Siachen region not possible with ground sensors, aerial remote sensing technologies would be required. Joint aerial monitoring missions would be used to demonstrate compliance with provisions of the agreement. This concept utilizes sensors on aircraft to periodically assess troop locations, equipment inventories, and status of operational or abandoned facilities. In this case, aircraft capable of high altitude flight would be required to permit observation at these extreme elevations. It is even possible that high performance unmanned aerial vehicles (UAVs) could be employed for this application to minimize concerns of piloted overflights. A variety of sensors including optical and video cameras, infrared line scanners, and radars would be used to provide the necessary assessments. Precedents for such cooperative remote sensing exist in the multilateral Open Skies treaty (signed but never entered into force) and bilateral agreements such as the 1991 Hungary/Romania open-skies agreement. Severe weather conditions may limit short notice aerial inspections but such conditions would also hamper any attempts at movements of ground forces.

An initial step in implementing monitoring provisions in Siachen is to conduct cooperative experiments to demonstrate the potential of these sensor technologies to successfully operate and detect activities along strategic paths of movement and at fixed locations such as posts or pickets. Field experiments with a variety of ground-based sensor technologies as well as trial flights of aerial monitoring systems would establish confidence in the technology. The process of working together to define and operate these systems will also build confidence between the parties.

As the countries move toward demilitarization of Siachen, concern may remain over the lack of national presence in the area. This concern can be addressed by replacing the current military presence with a scientific one. The concept for a "Siachen Science

¹⁸ See "Freezing the Fighting: Military Disengagement on the Siachen Glacier", Samina Ahmed and Varun Sahni, Sandia National Laboratories, SAND98-0505/1, March 1998.

¹⁹ This idea has been proposed by Lawrence Livermore National Laboratory.

²⁰ See Australia Antarctic web site at: <http://www.antdiv.gov.au/stations/live.html>

Center" suggests that the region be set aside for high altitude scientific research in ways similar to that done in the Antarctic Treaty.²¹ Cooperative efforts to conduct astronomy, glaciology, atmospheric science, human physiology and many other fields of study would provide a joint India/Pakistan human presence in the area but for scientific rather than military purposes.

Line of Control

The Line of Control (LOC) extends south of Siachen through the former principality of Kashmir. This line was established in January 1949 as a cease-fire line at the conclusion of the first India-Pakistan war. The cease-fire line was formalized with the signing of the Karachi Agreement in July 1949. Following the third India-Pakistan war in 1971, the cease-fire line (with some modifications) became the Line of Control. The LOC exists between the Indian and Pakistani disputed sections Kashmir. The Simla Agreement of July 1972 specified the line of control resulting from the December 1971 cease fire and called for the line to be respected by both sides without prejudice to the recognized position of either side. The line is characterized by different terrain conditions from valleys and rivers in the southern regions to high-mountain terrain up to the position of map coordinate NJ9842 at the start of the disputed Siachen region. The length of the LOC is 740 km.²²

While the LOC has been the subject of numerous agreements between India and Pakistan, efforts to cooperatively monitor the line do not exist. An agreement to implement cooperative monitoring would contribute to building confidence and reducing tensions along the LOC. Because this region, specifically the Kargil sector, represents one of the recent flashpoints in India-Pakistan relations, there is a sense of urgency for implementing confidence-building measures along the LOC. Detecting and characterizing illegal cross-border movements are vital to regional stability. These crossings may be politically, militarily or economically motivated but, in each case, threaten the fragile relationships of the region.

Border tension would be reduced through military-to-military interactions in the form of enhanced communication, threat minimization, exchange visits to deployment locations, and efforts to implement provisions of the Lahore declaration.²³ To begin, periodic joint meetings of military officials at predetermined locations along the LOC would be held. These meetings would later be expanded into inspections of selected military deployments along the LOC to demonstrate compliance with cease-fire or other agreements. Similar provisions exist in the 1993 and 1996 CBM agreements between

²¹ Kent L. Biringer, "Siachen Science Center A Concept for Cooperation at the Top of the World", SAND98-0505/2, Sandia National Laboratories, March 1998. Also available at: <http://www.cmc.sandia.gov/Issues/papers/siachen/index.html>

²² *The Hindu*, July 28, 1999. Other values are given in other references, e.g. 790 km in About India web site at www.aboutindia.com/neighbours/neighbor.htm.

²³ Shirin Tahir-Kheli, "The Role of Technology in India-Pakistan Agreements", *Balusa VII- India and Pakistan: Opportunities in Economic Growth, Technology and Security*, Foreign Policy Research Institute, Philadelphia, June 3, 1999.

India and China on Peace and Tranquility and on Military CBMs along their Line of Actual Control (LAC).

After establishing an effective dialogue and inspection regime, ground-based sensors would be deployed to supplement efforts by ground forces to monitor for unauthorized movements or actions along portions of the LOC. Use of specific sensors would vary along the LOC based on terrain, perceived threat, costs, and extent of sensor coverage. The LOC is a very porous boundary due to the variable terrain and wooded conditions in some portions. Instrumented fences would be deployed over relatively level terrain that represented primary routes of infiltration. Ground-based radars would provide broad area coverage over more rugged regions. Seismic and magnetic monitoring would provide detection and some characterization along known roads, paths or other routes of passage. Selective use of other technologies, such as fiber-optic cables and infrared break-beams, would be employed to detect movement across zones of interest. Sensor activations would alert both sides of possible violations of the integrity of the LOC. A joint monitoring center would be deployed in which to collect all sensor inputs and disseminate information.

In the 1970's Israel and Egypt, along with the United States, used deployments of sensor systems to monitor terms of the Sinai accords which helped maintain a cease-fire agreement and eventual withdrawal of Israeli forces from the Sinai following a war with Egypt. Two mountain passes, considered critical for launching a military attack across the Sinai, were instrumented with sensors and watch stations. This system ensured a separation of forces and permitted the peace process to evolve.²⁴

Because of its extent, the LOC would also be monitored using aerial remote sensing. A jointly manned aircraft, with an agreed suite of cameras and sensors, would be deployed to periodically overfly agreed portions of the LOC.²⁵ Such a mission would ensure that there is no military buildup, unannounced exercise or other threatening military action taking place in or near the LOC. Again, the process of defining and implementing such a cooperative monitoring regime is in itself part of the confidence-building process.

Working Boundary

A "Working Boundary" between Pakistani Punjab and Indian Kashmir also represents a portion of the boundary between the two nations but is not considered by Pakistan to be an international border because of the dispute over Kashmir.²⁶

Cooperative monitoring options along the working boundary would be similar to those along the LOC. However, the terrain is less rugged and more suitable to deployment of

²⁴ Michael G. Vannoni, "Sensors in the Sinai: A Precedent for Regional Cooperative Monitoring", SAND96-2574, Sandia National Laboratories, June 1998. Also available at: <http://www.cmc.sandia.gov/issues/papers/vannoni2/index.html>

²⁵ John H. Hawes and Teresita C. Schaffer, "Risk Reduction in South Asia: A Role for Cooperative Aerial Observation?" Stimson Center Report No. 31, Aerial Observation and Confidence Building, Michael Krépon and Michael Newbill, editors, August 1999.

²⁶ See Pakistan government web site at: www.pak.gov.pk/media/line_of_control.htm.

ground-based monitoring systems. India has been unilaterally fencing much of this boundary. Pakistan has objected to this action. Building confidence along this portion of the boundary would begin with discussions held among military commanders.²⁷ Portions of existing fences could be used for conducting joint experiments on instrumented border monitoring.

Figure 3 shows a composite commercial satellite image of the India-Pakistan boundary in Kashmir. Imagery can be a tool in helping to facilitate cooperation and resolution of territorial disputes. For example, satellite and aerial imagery was used to help define areas of separation and boundaries as part of the Dayton Accords, which resolved the conflict in Bosnia and Herzegovina. Such tools would be useful among South Asian negotiators in defining inspections, overflights or ground-based instrumentation deployments in Siachen, along the LOC, or along the working boundary.

International Border

The majority of the 2900-km boundary between India and Pakistan is an internationally recognized border.²⁸ In India, this represents the border with Pakistan in the Indian States of Punjab, Rajasthan, and Gujarat. In Pakistan, this consists of the border with India in the provinces of Punjab and Sind. The terrain varies from coastal salt marshes, through deserts to the agricultural districts of the Punjab. While there is little official traffic over this entire span, there is a great deal of smuggling and unofficial commerce. This area also represents a region of past conflict and near conflict as large military deployments and military exercises have taken place along this border. To minimize these threats an "Agreement between India and Pakistan on the Advance Notice of Military Exercises, Maneuvers and Troop Movements" was concluded between the two sides in 1991. It was applicable along the international border as well as the Line of Control. In that same year, another agreement on "Prevention of Air Space Violations and for Permitting Over- Flights and Landings by Military Aircraft" was also concluded.

Increased confidence building along the border would result from the addition of monitoring provisions to the existing military exercise and airspace agreements. Initial efforts would consist of invited observations of military activities or exercises occurring near the border. This transparency measure would reduce tensions and misinterpretation of military intent. Notifications and monitoring of these activities avoid bringing countries to the brink of war, as was the case during the Brasstacks military exercises of 1986-87. In addition to notifications or monitoring of military activities along the border, agreements on further restrictions of movements or deployments may be possible. Such agreements could be expanded to include broader demilitarized or arms limitation zones along the borders to further increase warning times and reduce likelihood of conflict. The two sides could also work together to provide better border demarcation particularly in the more remote and less populated desert portions of the border.

²⁷ A recent four-day meeting between border commanders was held in Lahore to discuss exchange of fire along the working boundary. expressindia.com, November 23, 1999.

²⁸ World Fact Book 1999, Central Intelligence Agency, www.odci.gov/cia/publications/factbook/in.htm. Total distance of 2912 km includes disputed areas such as Sir Creek, LOC in Kashmir and Siachen.

The cooperative use of radar-equipped tethered balloons to monitor for low flying aircraft in selected portions of the border regions would enhance the existing agreement on "Prevention of Air Space Violations". This technology can also be used to assess ground movements in the border regions. Tethering a balloon controls the altitude and position of the instrumentation. Joint manning of the balloon deployment and data collection would establish a precedent for cooperative monitoring and data sharing. Technologies of this type are deployed along the US/Mexican border and other international borders including that between Kuwait and Iraq. A more extensive border monitoring regime would include cooperative aerial overflights along the established border to verify compliance with bilateral agreements or to work together to combat issues such as illegal drugs or smuggling.

Other regional precedents exist for border cooperation. India and China have concluded two recent border agreements in 1993 and 1996. While many of the provisions, including notifications, exercise limits and aircraft restrictions, are similar to those already in place in India-Pakistan agreements, others offer additional prospects for building confidence. Chief among them may be exchanging maps, conducting flag-officer-level meetings at designated border locations, assisting in the sharing of information on diseases and providing disaster assistance. Similar CBMs could be employed along other sections of the boundary.

Border cooperation would also support economic development and trade. There exists not only a large "unofficial" trade between India and Pakistan but also a huge untapped potential for legitimate trade if tensions and restrictions were lifted. Efforts to technically cooperate in monitoring and facilitating trade could pay tremendous dividends. These efforts might include border development zones, modern customs and border crossing stations designed to streamline paperwork and vehicle inspections, as well as cooperative efforts to build an infrastructure of roads and communication to move goods and services between the trading partners. In this case, technology and monitoring systems are used not only to prevent actions but also to facilitate legitimate activities, such as authorized cross-border trade. Since there is a minimum of existing cross-border infrastructure, there are opportunities to work together to design border crossings and related infrastructures (i.e. roads, pipelines, power, communications, etc) to take advantage of the latest technologies and efficiencies. For example, implementing improved customs records and communication would enable quicker border inspections and more cost-effective movements of goods. Other examples include use of electronic shipping records, instrumented border crossings, real-time shipment tracking, and tags and seals for improved cargo security.

Environmental cooperation along the border offers another means for establishing the infrastructure for border cooperation. Cooperation on water resources involves joint measurements of river flow rates or surface or ground water quality. There might also be joint efforts to better coordinate information related to flood management or watershed terrain mapping. Deployment of a network of air quality monitors along the border would help in better managing industrial development and responding to public health

threats. Such air quality measurements could even include measurements of atmospheric radionuclides as an initial step in cooperation on nuclear topics.

Sir Creek

The Sir Creek issue involves defining the international boundary along Sir Creek, a 100-km-long estuary in the saline wetlands of the Rann of Kachchh between the states of Gujarat in India and Sind in Pakistan.²⁹ The dispute stems from maps drawn in 1914 and 1927 that trace different boundaries along Sir Creek. The earlier map depicts the boundary on the east bank of the creek. The later map depicts the boundary along the midpoint of the creek. The official Indian government position interprets these maps as defining the boundary along the midpoint of the creek, with the boundary shifting as the creek meanders. Pakistani officials interpret the boundary as being along the east bank of the creek, and fixed geographically.³⁰ In addition to the historical dispute, accumulated sediment has created new land that did not exist at the time of the earlier maps requiring an extension of the boundary to the new shoreline. How this line should be extended is also in dispute. The direction of the line will affect the determination of Indian and Pakistani Exclusive Economic Zones along the continental shelf and beyond.

Sir Creek is the subject of its own working group in the bilateral dialogue between India and Pakistan. Because of its finite length and disputed nature, Sir Creek offers the potential for its own specific monitoring regime appropriate to agreements that may be forthcoming. As in the case of Siachen, one possibility is a demilitarization of the Sir Creek area. Such an agreement would permit joint monitoring to ensure absence of military or paramilitary troops or smugglers. A cooperative aerial monitoring regime would support such an agreement, build confidence and avoid conflicts such as the downing of a Pakistani naval aircraft in August 1999. That incident stemmed from unilateral aerial observation near disputed territory. The regime would permit periodic aerial overflights along the disputed boundary with jointly manned aircraft.

Another cooperative venture is in the environmental realm where joint scientific studies of pollution, water quality, water flows and other measurements important to coastal and estuarine plant and animal life could be jointly undertaken.³¹ This would shift the focus to cooperation while the political process continues to address Sir Creek as an area of territorial dispute. Coastal cooperative environmental programs have been conducted

²⁹ A. G. Noorani, "CBMs for the Siachen Glacier, Sir Creek, and Wular Barrage", Crisis Prevention, Confidence Building, and Reconciliation in South Asia, Edited by Michael Krepon and Amit Sevak, Henry L. Stimson Center Book, 1995.

³⁰ Gaurav Rajen, "Cooperative Environmental Monitoring in the Coastal Regions of India and Pakistan", SAND98-0505/11, Cooperative Monitoring Center Occasional Paper, Sandia National Laboratories, June 1999.

³¹ Gaurav Rajen, "Cooperative Environmental Monitoring in the Coastal Regions of India and Pakistan", SAND98-0505/11, Sandia National Laboratories, June 1999. Also available at: <http://www.cmc.sandia.gov/issues/papers/coopenv/index.html>

successfully in other regions. One example is the effort between Israel and Jordan to cooperate in establishing the Red Sea Marine Peace Park.³²

Maritime Boundary

Often overlooked is the boundary between nations that extends beyond land into the sea. Because of disputes over the coastal land boundary along Sir Creek, there is an accompanying dispute over the maritime boundary that extends 200 miles to sea, covering the exclusive economic zone of the two nations as well as their national security boundary. The undemarcated and disputed nature of this maritime boundary has already caused international incidents; fishermen from both sides have been detained for claimed violation of maritime boundaries. Continuing the unresolved nature of this boundary could lead to increased naval conflict. Conflict in the region also limits the potential of both sides to attract the capital investment necessary to develop the natural resource potential of the region including offshore oil or gas deposits.

Several maritime confidence-building measures would contribute to improved relations. While the exact maritime boundary may remain in dispute, efforts to demarcate the extent of the region of dispute would serve to reduce the number of incidents of vessels mistakenly entering disputed territory. Cooperative deployment of ocean buoys by India and Pakistan would demarcate the area of dispute. As a minimum, this alerts the commercial and military vessels of both sides of areas to be avoided. This effort would be further enhanced through supply of global positioning system receivers to selected commercial or fishing vessels. These receivers would provide unambiguous location information that would also reduce incidents of claimed border violations.

Cooperative efforts at search and rescue or disaster response in coastal regions offer additional opportunities for technical collaboration. Joint communications to share information on emergencies and periodic exercises to test ability to work together would serve as confidence building measures. While these represent only the beginning of potential areas of maritime cooperation they are achievable and may be politically acceptable. They provide the basis for expansion to even broader areas of cooperation in the future.

Summary and Conclusions

Cooperative monitoring can contribute to moving India and Pakistan beyond some of the current issues of distrust and impediments to progress in their relationship. Options exist for collaborative projects to monitor activities and issues along all of the boundary regions of the two states. Some of these options build on established political will and an existing framework of agreements that include both security and environmental topics.

³² Aqaba Region Authority, 1997, "The Red Sea Marine Peace Park - Aqaba, A Summary", Proceedings, Middle East Seas Regional Strategy Workshop for the International Coral Reef Initiative, Aqaba, Jordan September 21-25, published by the U.S. National Ocean Service, U.S. National Oceanic and Atmospheric Administration, Silver Spring, MD, USA.

Costs have not been explicitly defined in this paper. Costs to implement the monitoring and inspection provisions outlined here vary widely. Some efforts such as periodic meetings or inspections can be conducted for very little cost, especially incremental costs if inspectors or meeting participants are already government or military personnel. Other systems such as extensive border monitoring deployments over long distances could require tens of millions of dollars to fully implement. However, in nearly all cases, the costs of these efforts to reduce tension are small compared to the high costs of conflict. For the Siachen conflict alone, recent estimates suggest that India spends \$350,000 to \$500,000 a day on its Siachen deployments.³³ In addition to the high financial costs, there are tremendous costs in the human suffering, both military and civilian, resulting from this ongoing conflict.

The ideas presented in this paper seek to enhance border cooperation between India and Pakistan. It is hoped that by thinking about the many possibilities for cooperation, some will pass the political, military, and financial constraints that could limit implementation and keep India and Pakistan from moving ahead with improved relations. As history shows, past difficulties in relations have not kept India and Pakistan from agreement on some issues of mutual concern. The recent border conflict in Kargil demonstrates the importance of moving forward toward better management of border problems. Technology can be an important tool in such an undertaking.

³³ "India and Pakistan: Frozen in Fury on the Roof of the World", New York Times, May 23, 1999.

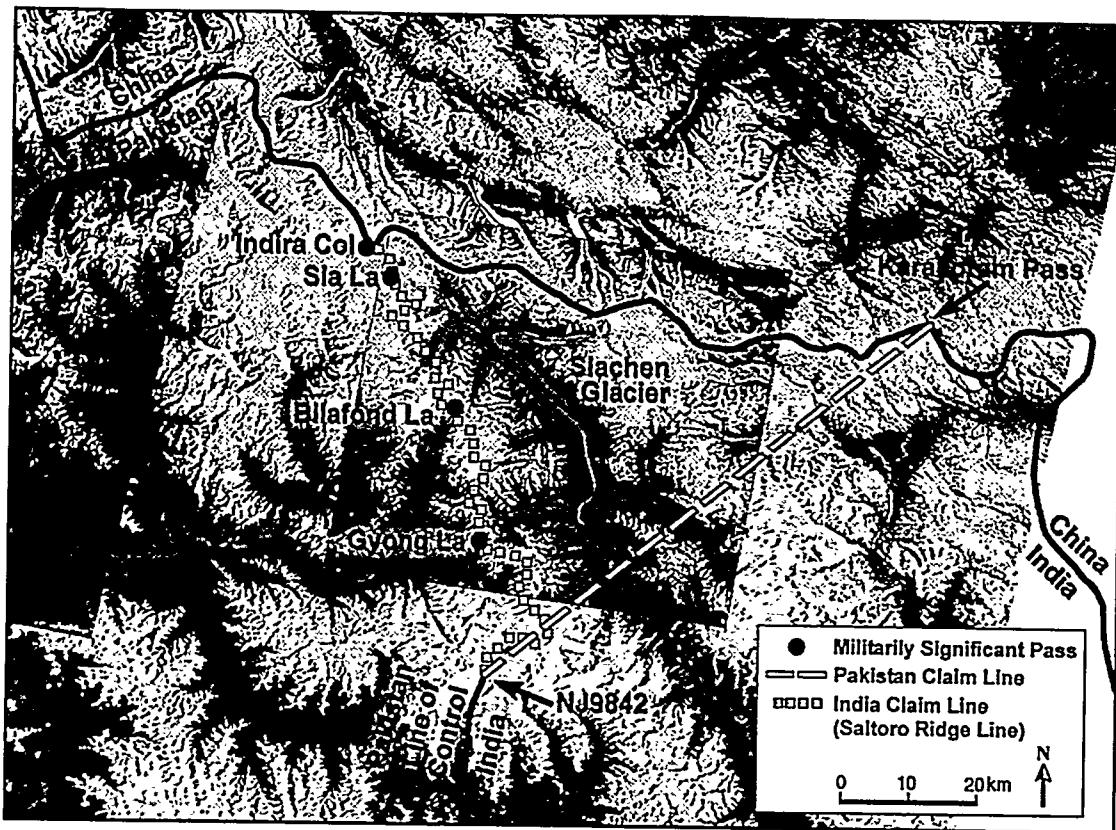


Figure 1. Siachen Glacier region composite satellite image showing claims lines and areas of dispute.

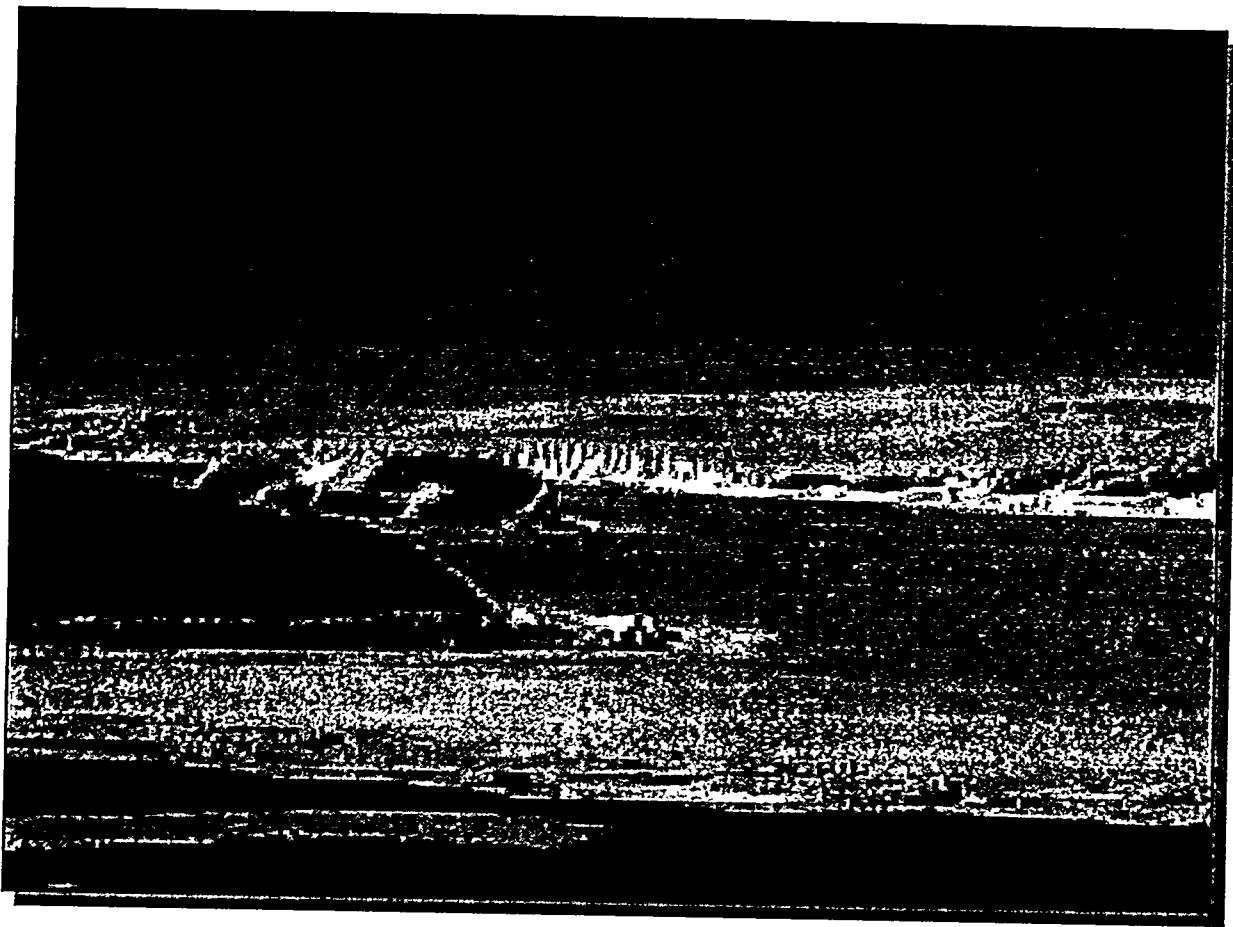


Figure 2. Internet camera photo of region surrounding Australian Mawson Station in Antarctica.

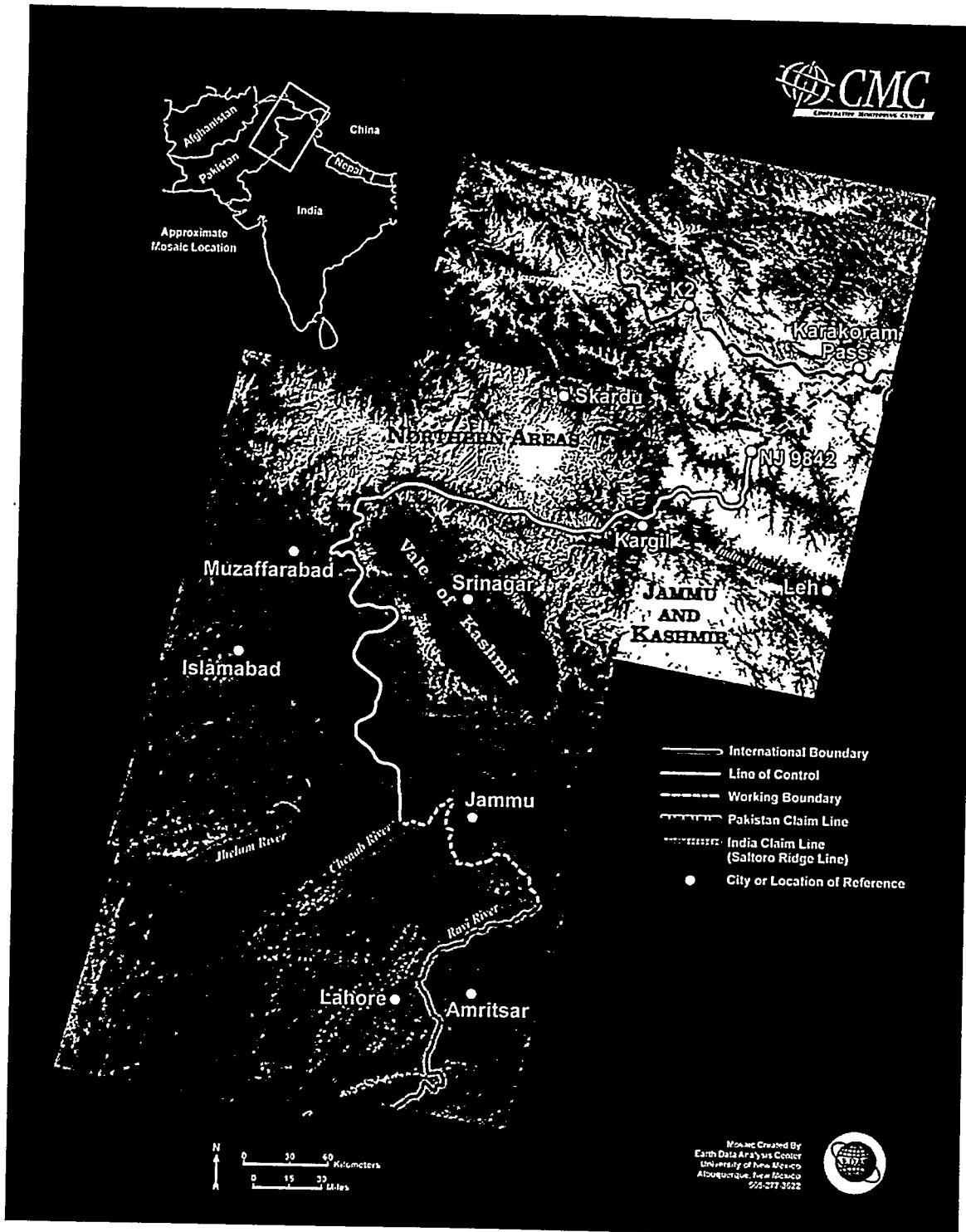


Figure 3. Composite satellite image of Kashmir showing Siachen, Line of Control (LOC), working boundary and international border.