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Climate Change and the Indus Basin

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Amb Kakakhel joined the Foreign Service in 1969. His overseas postings included Beirut, Cairo, Bonn and Jeddah at junior levels and in New Delhi and Nairobi as Deputy High Commissioner and High Commissioner respectively. During his tenure in Delhi, Shafqat Kakakhel represented Pakistan as Permanent Representative to the UN Environment Programme and the UN Centre for Human Settlements-HABITAT from September 1994 to August 1998. He was elected President of the UNEP Governing Council in May 1995 and was the Chief Negotiator for the G-77 in the preparatory meetings of the second World Summit on Human Settlements in 1995-6 and was elected chair of the main negotiations committee at the Summit held in Istanbul in June 1996.

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Climate Change and the Indus Basin

Amb. Shafqat Kakakhel

Nearly all the negative impacts of climate change listed by the Inter-Governmental Panel on Climate Change (IPCC) in its latest, Fourth Assessment Report issued in 2007 (IPCC FAR 2007) relate to water. These impacts are likely to further exacerbate the serious water-related challenges in India and Pakistan, the major beneficiaries of the Indus River Basin (IRB), one of the most important sources of fresh water in the South Asian sub region. The water resources of the IRB have come under relentless pressure due to burgeoning populations, economic development, an unprecedented increase in the number of financially well-off people who tend to use higher quantities of water, urbanisation, the unsustainably high share of water used by the agriculture sector, pollution, decay of water infrastructure, and mismanagement of water resources. Growing realisation of the looming water crisis had led India and Pakistan to step up efforts at national level to address the challenges.

Governments in both countries have also paid lip service to bilateral and regional cooperation on water issues. However, a mismatch between pronouncements and actions has continued to mark the landscape. A significant advance in bilateral cooperation on water issues is predicated on a shared political resolve to move beyond dispute settlement and forge efficacious processes and frameworks for mutually beneficial collaboration at bilateral and sub-regional levels.

IMPACTS OF CLIMATE CHANGE ON THE IRB

The water-related adverse effects of climate change include inundation of islands and cities in the coastal regions by surging sea water and salination of farm lands and aquifers; rapid melting of the glaciers in the Himalaya-Karakorum-Hindu Kush caused by rising temperature which would initially increase the flow of water causing flash floods and glacial outburst lakes, followed by reduced flows in the rivers fed by the glaciers after they can no longer accumulate and store ice and snow for orderly melt and release of water; disruption of the timing and intensity of the twice yearly monsoon rains which replenish rivers and aquifers and extreme water-related events such as drought and floods which are likely to occur more frequently, with greater severity and longer duration.

The high altitude glaciers in the IRB have served as water repositories accumulating snow and ice at high elevation and releasing melt water feeding the IRB which represent more than 50% of its water. Whilst these glaciers have remained "unstudied" and "understudied" due to their location, lack of technical capacity and other constraints, most of them are reported to have been in a state of retreat during the 20th century and the recession rates have apparently accelerated between 1970 and 2000. Climate change and rising temperature will initially cause rapid melting of the glacier snow and i.e. causing glacial outburst lakes (GLOFs) but in the long run the glaciers will recede and water discharges from them fed to the IRS will be reduced. According to some estimates the IRB will lose up to 8.4% of its total water resources in 2050. Experts agree that the rates of recession of the glaciers will be higher in case of higher temperature. More reliable predictions of the water loss from the glaciers will depend on adequate monitoring of the glaciers which would require close cooperation between India, China, Nepal and Pakistan. There is relatively more reliable evidence regarding the other impacts of climate change such as the decreasing levels of the monsoon precipitation levels and

a marked increase in extreme events such as drought and floods, such as the great flood of 2010 in Pakistan which affected more than 20 million people and caused colossal damage which has not yet been repaired. Coastal region in Southern Pakistan has also reportedly experienced sea level rise and its adverse effects.

The predicted decrease in the water flows of the IRB will have serious consequences for India and Pakistan which receive 63% and 36% of its water. Although the water from the IRB amounts to no more than 7% of India's total water sources, the areas irrigated by the watercourse is one of the major bread baskets of India and crucial for its food security. According to Indian estimates, the three Western or West flowing rivers (Indus, Chenab and Jhelum) have a potential of enabling generation of 12 GW of electricity. India has completed 7 projects producing 2220MW of electricity; 5 projects with capacity of producing 1109 MW are under construction whilst 45 projects are in the "wish list". For Pakistan, the IRB is the main source of water for human consumption for its rapidly growing population and irrigating its predominantly arid and semi-arid land. Agriculture is the backbone of Pakistan's economy, contributing 22% of its GDP, 45% of all jobs, livelihoods for the rural population and 80% of raw material for its mainly agro-based exports. Hydro-power generation enabled by the Mangla and Tarbela dams which depend on the IRS constitutes the bulk of the country's electricity supply. A number of hydro projects, including the Jhelum-Neelum are under construction. Pakistan too has a long "dream list" of additional projects.

Per capita availability of water in the IRB has suffered a 70% decline during the past few decades. Demographic trends in both India and Pakistan are fraught with ominous consequences for the water sector with serious impacts on their food and energy security. In India, per capita water availability stood at 1539 cubic metres in 2011 and in Pakistan less than 1000 cubic metres. Demographic changes during the future will further aggravate water scarcity; India's population will burgeon to 1.5 billion in 2030 and 1.7 billion in 2050 which will reduce per capita availability of water to 1132 cubic metres whilst Pakistan will have to contend with a population of 234 million in 2030 and 275 million in 2050 with per capita availability of water plummeting to 545 cubic metres.

CLIMATE CHANGE POLICIES OF INDIA AND PAKISTAN

Governments and non-state stakeholders in both India and Pakistan and international financial and other institutions have shown increasing concern over the rapidly deteriorating water situation threatening their economies and societies. Indian and Pakistani governments are also aware of their obligation as parties to the UN Framework Convention on Climate Change (UNFCCC) and as responsible members of the international community to contribute to the global efforts to stabilise the global climate. Accordingly, they have embarked on wide ranging efforts to not only adapt to the negative impacts of climate change and global warming on water and other crucial sectors but also restrain their greenhouse gas emissions by adopting a climate-compatible paradigm of socio-economic development. India announced its National Action Plan on Climate Change in 2008 which has led to the establishment of eight multi-stakeholder technical working groups called National Missions to suggest measures in respect of solar energy; energy efficiency; sustainable habitat; water; Green India; the Himalayan eco-system; sustainable agriculture and strategic knowledge on climate change. India has also revised its policies on sectoral issues, including integrated water resource management, health, forests etc with a view to integrating and mainstreaming climate change imperatives in the overall process of development planning. In 2008 Pakistan also initiated a process of assessing the impacts of climate change on its key economic and social sectors, including water, food and energy security, health and disaster management which has led to the formulation of a comprehensive climate change policy approved by the Federal Government in September 2012.

The policy comprises nearly 120 recommendations on climate change mitigation and adaptation by key economic sectors including water-related sectors of water, food and energy security, health and disaster management, aimed at protecting the country's socio-economic development from the negative effects of climate change and enabling Pakistan to contribute to global climate goals. Action plans on adaptation and mitigation are in an advanced stage of formulation. In both India and Pakistan the discourse on climate change has focused on the plight of the climate vulnerable communities and enlisting the active participation of stakeholders in climate change-related discussions and actions. New scientific and technical institutions have been established and the ones set up in the past significantly strengthened.

THE INDUS WATERS TREATY

India and Pakistan as well as the international community at large have recognized the need for serious and deliberate efforts to establish cooperation in addressing the growing challenges of water scarcity and other impacts of climate change, especially in relation to the Indus River Basin.

India and Pakistan negotiated with the assistance of the World Bank a bilateral agreement on the sharing of the Indus River Basin called the Indus Waters Treaty (IWT) which was signed in 1960. The inability of the two countries to agree on a basin-wide regime of managing and sharing the water of the Indus River System led to the "partitioning" of the six major tributaries of the Indus: the three Eastern Rivers: the Sutlej, Beas and Ravi were allotted to India for its exclusive use; the three Western Rivers: the Jhelum, the Chenab and the Indus itself flowing into Pakistan-administered Kashmir from Indian administered Kashmir were allocated to Pakistan. However, India was permitted to use the water under a set of restrictive clauses for irrigation, hydro generation and other non-consumptive purposes. The IWT contains detailed "permissive" and "restrictive clauses" regarding the uses permitted to India which are meant to ensure adequate and unhindered flow of water for Pakistan's priority needs. The IWT

provides for a comprehensive dispute avoidance and settlement mechanism comprising a Permanent Indus Commission (PIC) consisting of separate commissions established by the two countries and serving as a conduit of communication and consultation, exchange of information likely to forestall and resolve differences arising during the implementation of the agreement and arbitration if the dispute cannot

be resolved through bilateral means. The IWT has been hailed as a landmark agreement which has survived wars and periods of tension. So far one dispute has been resolved through high level discussions; one dispute has been resolved through arbitration enshrined in the treaty, one is being considered by the Permanent Court of Arbitration whilst another is being considered in the high level dialogue. The IWT also contains provisions for regular exchange of data on river flows and water utilisation as well as cooperation for the setting up of hydrological and meteorological observation stations, carrying out drainage works and collaboration on engineering works.

CONCERN OVER CLIMATE CHANGE IMPACTS ON WATER RESOURCES: CALLS FOR COOPERATION

Growing knowledge on the negative impacts of climate change in general and on the Himalaya-Karakoram-Hindu Kush glaciers and the monsoons have led to heightened interest within and outside the Subcontinent in matters related to the IRS with focus on ensuring that the adverse impacts of climate change, especially the predicted drop in the shared water flows, do not provoke tension and conflict between India and Pakistan given their adversarial relations in the past.

Increasing attention is being paid to the need for cooperation in achieving a scientifically credible understanding of the impacts of climate change, especially on the state of the HKH glaciers and the

monsoons as well as precipitation trends, drought and floods and measures to cope with them. A report on "Climate Change and its Possible Security Implications" submitted by the UN Secretary General to the General Assembly in 2009 noted that whilst "major river basins in South Asia are all vulnerable to unpredictable effects of climate change, the Indus' flow is uniquely dependent on the seasonal runoff from shrinking Himalayan glaciers", which, it added, "poses new challenges for cooperation under the Indus Treaty, and efforts will be needed at all levels to ensure its continued effectiveness". Reports

prepared by the Congressional Research Service (CRS), the Foreign Relations Committee of the US Congress, the US Central Intelligence Agency (CIA) as well as studies commissioned by the World Bank, the Asian Development Bank and those carried out by a host of scientific institutions on the threats posed by climate change and responses to them have highlighted not only the potential of conflict between India and Pakistan over a likely drop in the IRB's water flows but also of cooperation in improved understanding of, and adaptation to, the effects of climate change and other issues concerning water resource management. Retired Indian and Pakistani civil servants and

diplomats, including those who had dealt with water-related disputes between their countries, experts and representatives of civil society committed to the goal of peace and constructive cooperation in the

Subcontinent, who have participated in un-official, Track 2 dialogues sponsored by think tanks in India and Pakistan and their external partners, have stressed the urgency of addressing three sets of water-related issues. These include:

1. Strengthening the dispute avoidance and settlement mechanism outlined by the IWT as well as implementation of Articles 6 and 7 pertaining to exchange of information and data and joint projects;

2. Addressing issues that were not understood during the decade long negotiations culminating in the signing of the IWT and, therefore, not addressed by the agreement, such as the impacts of climate

change, the pollution of rivers from agricultural and industrial runoff in the catchment areas, the environmental flows in the Eastern Rivers allocated to India, the cumulative capability accruing to India from the construction of dozens and perhaps scores of hydro-power projects built by India using the water of the Western Rivers even though the projects are in compliance with the IWT to manipulate the water flows which might hurt Pakistan; and the need for ensuring the sustainability of aquifers;

3. Promotion of integrated management of water resources management addressing both the demand and supply aspects within a broad framework of multi-faceted cooperation and collaboration.

The rich menu of recommendations for cooperation on water issues emanating from the Track 2 deliberations include cooperation in achieving more credible knowledge of the impacts of climate change in general and the state of the HKH glaciers and monsoons and river flows, including through the setting up of in-situ monitoring and stations in the glacier zones, development of programmes on glaciology education and relevant technology, adaptation measures for coping with higher temperature, development of seeds and plant and livestock varieties that need less water, improved irrigation methods such as sprinkle and drip irrigation, water recycling innovations, measures to control water pollution, maintenance of water infrastructure including canals, improved water governance, including water pricing, development of a digitalised online model of the Indus Basin for fostering regional networking and hydrological modeling, building and strengthening of knowledge on the underground water resources in the IRS in order to ensure the health and sustainability of ground water supplies, and measures to strengthen Articles 6 "Exchange of Data" and Article 7 "Future Cooperation" provisions of the IWT.

Experts have also suggested that whilst striving to forge cooperation at bilateral level, India and Pakistan should utilise the existing mechanisms for regional cooperation such as SAARC and

institutions such as the International Centre for Integrated Mountain Research, as well as UN and other multilateral agencies, and technical and scientific institutions in friendly countries outside the region. Most of these suggestions are not only non-controversial and do not pose any risks for the national security of the two countries, they are in conformity with the objectives of their Climate Change policies and action plans and, above all, they are perfectly do-able and cost-effective.

BILATERAL COOPERATION

At the official level, for most of the past six and a half decades the focus of contacts and communication between India and Pakistan through formal channels has been on avoidance and/or settlement of differences and disputes relating to the IWT. Both countries have routinely endorsed declarations and statements on climate change adopted by SAARC Summits and the Ministers of Environment of SAARC

member countries. However, a potentially promising beginning was evidently made during the resumed sessions of the India- Pakistan Joint Commission in 2011 and 2012. The two countries not only reiterated their resolve to strengthen the implementation of the IWT but also convened technical-level Working Groups (TWGs) to suggest measures for cooperation in eight areas of "mutually beneficial cooperation": Agriculture, Education, Environment, Health, Information, Information Technology and Telecommunications, Science and Technology, and Tourism. The TWGs met during the Joint Commission

in 2012 and came up with suggestions for cooperation. The WG on Environment agreed to promote cooperation on climate change, renewable energy, environmental protection, energy conservation, clean development mechanisms, biodiversity, sustainable forest conservation and solid waste representing nearly the entire spectrum of environmental and sustainable development issues. The WGs on agriculture and science and technology also identified several avenues of cooperation. Notably the Joint Statement issued on 7 September 2012 at the conclusion of talks between the Foreign Ministers of India and Pakistan referred to the work of the TWGs in Para 25 of their 28-para statement referring to the annex of their statement containing summaries of the discussions. Regrettably this landmark development does not seem to have attracted the attention of the media and the civil society whose support would be indispensable for ensuring adequate follow up on the decisions of the JMC. There is at present no sign of any significant move in either country on the implementation of the suggestions made by the TWGs.

REGIONAL COOPERATION

At the regional level, the recommendations made by the Ministers of Environment of SAARC member countries are notable, especially the Declaration and Action Plan on Climate Change adopted at their

special session in Dhaka in 2008 containing elements of a common position on the global climate change negotiations and areas of regional cooperation. The SAARC Ministers of Environment also constitute the governing body of the South Asia Cooperative Environment Cooperative Programme (SACEP) established with support from the UN Environment Programme (UNEP) in 1982, whose secretariat is hosted by Sri Lanka in Colombo and has been engaged in efforts to promote cooperation in priority environmental spheres.

The 16th SAARC Summit hosted by Bhutan in 2010 was devoted to climate change and adopted a statement on climate change and established an Expert Group on Climate Change to identify specific areas of cooperation. The Summit also witnessed the signing of the SAARC Convention on the Environment which has since been ratified by most member states. Progress on the follow up of nearly all the decisions and recommendations evolved at SAARC meetings has been slow and inadequate.

CONCLUSIONS

There is widespread consensus among experts that the variations in the patterns of the glaciers notwithstanding a decrease in the ice volumes has been observed in all the Himalayan glaciers except the Nanga Parbat whose behaviour has been "complex". It is also agreed that the accumulation of black carbon on the glacier surfaces also affects temperature, the monsoons and precipitation which are likely to alter the rates of melting of the glaciers and the timing and quantities of releases of water in the IRB. The Climate Change policies and action plans of India and Pakistan and the terms of reference of the various National Missions established in India have underlined the need for cooperation among the IRB littoral states in an improved understanding of the trends in the HKH glaciers that would bridge the knowledge gaps and enable the formulation of policy options based on scientific evidence. Relevant institutions in the region such as ICIMOD and those in US and Europe such as NOAA, NASA, and ESA could complement the work of the local institutions. The Coordinated Regional Downscaling Experiment (CORDEX) programme initiated by the World Climate Research Programme which plans to organise a series of scientific workshop across South Asia could be enormously useful in augmenting regional

capacities for multi-model simulations and assessment of regional climate change.. The decision of the India- Pakistan Joint Ministerial Commission in September 2012 to " promote mutually beneficial cooperation" in eight areas including agriculture, environment, health, and science and technology is an unprecedented but welcome decision which needs to be implemented in letter and spirit.

India and Pakistan should make concerted efforts to translate their proclaimed determination to implement the Indus Waters Treaty, including the efficacy of the Permanent Indus Commission and follow up on Articles 6 and 7 of the Treaty in to tangible actions. They should seek to minimise recourse to time consuming and costly arbitration by avoiding and /or resolving misconceptions and differences through bilateral channels.

Alongside the bilateral track, India and Pakistan need to work together to strengthen the role of SAARC in addressing climate change and other environmental challenges in the region. They need to decouple

the implementation of decisions and recommendations of SAARC and SACEP from the negative fallout of the vicissitudes of their bilateral relations so that the full potential of these institutional mechanisms for mutually beneficial cooperation and collaboration can be realised. The various SAARC Centres established or recommended by SAARC Summits could serve as crucial catalysts for cooperation.

India and Pakistan and other SAARC member states need to utilise the avenues for cooperation offered by the UN and other multilateral agencies for climate change-related cooperation.

India and Pakistan should lead efforts to promote networking among relevant regional and international scientific institutions fully utilising the platforms offered by the Science and Technology

mechanisms being evolved under the UN Framework Convention on Climate Change and other multilateral agreements. They should actively support initiatives such as the WMO.ICIMOD project " The Hindukush-Himalaya Hydrological Cycle Observation System " (HKH-HYCOS) launched in 2001 aimed at boosting regional cooperation in hydrological data collection and sharing for flood forecasting to support disaster prevention and flood management at regional level. There is urgent need to strengthen

the Regional Flood Information System (RFIS) established by the project. Similarly the South Asia Network for Development and Environmental Economics promoted by the IUCN as far back as 1999 should be resuscitated The Asia Pacific Network for Global Change (APN) is yet another platform that deserves to be availed by South Asian countries.

Civil society organisations, including environment and sustainable development think tanks have been playing an active role in promoting cooperation in diverse areas, including water resources. There is now need for broader and inclusive coalitions in South Asia capable of galvanising collaboration among Government agencies, the private sector, the scientific community, the media and civil society as a whole in order to address the rapidly escalating challenges of water scarcity and other consequences of climate change.