PAKISTAN WATER SECURITY DILEMMA – APPROACHES TO REJUVENATING THE INDUS WATERS TREATY

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Abstract

This paper briefly traces the history of water disputes which emerged immediately after the partition of the sub-continent into two independent and sovereign states of India and Pakistan. It highlights the firm views of India and Pakistan on riparian water rights prior to signing of the Treaty in 1960. It further mentions the strong reaction of Indian Lok Sabha against the Treaty. Also, India has signed bilateral agreements with Nepal and Bangladesh and this article evaluates the extent to which these treaties have been honoured by India and what lessons can be learnt from those treaties. This research paper also discusses the evolution of the International Water Laws since the signing of the Indus Waters Treaty. At the end, available options are discussed to move forward to rejuvenate the Indus Waters Treaty.

Background

Water disputes between India and Pakistan emerged immediately after the partition of the sub-continent into two independent and sovereign states. This partition unfortunately cut across the already established and well functioning networks of irrigation canals and numerous hydraulic structures with control structures of the eastern rivers falling within the domain of India and canal network extending into West Punjab and irrigating some 5 million acres of fertile land. Soon after the partition, India communicated to Pakistan of its intention to divert the waters of eastern rivers for its own uses. As the control structures were in Indian Territory, India could do it easily. This meant that the single and only economic base of Pakistan i.e. irrigated agriculture would be left high and dry. This act of

India tantamount to strangulating Pakistan's agro-based economy and igniting the fuse for a major war. The sensitivities of this issue were realized by international communities as well and with the good offices of the World Bank and over a decade of negotiations, Indus Waters Treaty was signed in 1960 between India and Pakistan with World Bank as a guarantor and also signatory to the Treaty. Under this Treaty the three eastern rivers viz. Ravi, Sutlej and Beas were given to India and the three western rivers namely Indus, Jhelum and Chenab were given to Pakistan with limited uses by India.

Post Treaty Reaction[1]

The Treaty was not the best for either side. There were conflicting principles put on the table by both sides. Indians held their argument on "equitable utilization" – the favourite of the International Law Association and took the position that Pakistan got 75% of the water represented violation of the principle of "equitable utilization". The Treaty came under heavy fire in the Indian Parliament and was subjected to trenchant criticism by most of the speakers who participated in the *Lok Sabha* debate on the subject on 30th November 1960. They blamed the Government of India for a policy of appeasement and surrender to Pakistan and said that Indian interest had been let down.

From Pakistan side the fact that they were allocated only 75% of the water when they had 90% of the irrigated land represented a violation of the principle of "appreciable harm" – the favourite of International Law Commission.

Denial of perennial flows to Pakistan of three eastern rivers created tremendous management problems and resulted in the first "hydrological shock" whereby the vast and most productive irrigated land was deprived of perennial flows of river waters. The three rivers allocated to Pakistan under the Treaty were in the west whereas the irrigated land was in the east with hundreds of kilometers of distance between them. Pakistan not only had to undertake massive engineering works to transfer the water of western rivers to

east through storage dams, inter-river link canals, barrages, headworks etc, construction of these infrastructural works were the largest civil engineering works ever undertaken in the history of the world and had to be completed within a record and challenging period of 10 years. Pakistan not only faced the problem of infrastructural development but had to set aside a large sum of money annually to meet the future operation and maintenance cost of these huge hydraulic structures exposing itself to a very high degree of structural safety hazards. The three eastern rivers allocated to India had a cumulative flows of 33 MAF out of which India was only utilizing 3 MAF and left with 30 MAF for future expansion. Against this Pakistan did not get any additional water and had to develop storages for its future requirements. It was therefore a difficult situation for both India and Pakistan as both were depending upon position based arguments.

India's Bilateral Treaties with Nepal and Bangladesh

Treaties between India and Nepal[2]

Nepal and India so far have entered into agreements on the construction of Joint Projects on three main rivers-Koshi, Gandaki and Mahakali. Among the three Projects first two are in operation while the third one on Mahakali River has not yet been started.

The Koshi agreement was signed between the two countries in 1954. This Project was basically aimed at controlling flood in India and providing much needed irrigation to the Indian fields. The Project was constructed in Nepal near the Nepal India border. A barrage has been constructed with two out-flowing canals. The entire water of Koshi River has thus been connected to India leaving Nepal with some water to irrigate about 15 thousand hectares of land. The irrigation water supplied to India could irrigate about 595,000 hectares of land. The entire cost of the Project was borne by India. A small power house of 20 MW is to be built in India whose 50% power is to be provided to Nepal on mutually agreed price.

The Gandak Project Agreement was concluded in 1959 between Nepal and India on River Gandak. Like the Koshi Agreement, the Gandak Agreement also is meant to construct a barrage to control the flood downstream in India and irrigate its land, leaving some water to irrigate 39,600 hectares of land in Nepal. The entire flow of the river passes to India which irrigates 920,520 hectares of land in India. A small power house of the size of 15 MW was constructed using the canal water for supplying power free of cost to Nepal.

Both these agreements are widely criticized by Nepalese people. As such, they were subsequently amended. However, those amendments did not alter the substance of the agreement particularly the sharing of benefit between the two countries. They remained heavily imbalanced. As a matter of fact, these were the projects done in Nepalese soil by India for their own uses. Whatever meager benefit was given to Nepal was simply a some fraction as a good will gesture. Till to date, in the mind of the general public of Nepal there is an ill feeling about India due to these projects.

In 1996, an agreement was signed into between India and Nepal on the Integrated Development of Mahakali River. This agreement combines three different projects – the Sarada Barrage, the Tanakpur Barrage and the Pancheshwar Dam on the river. The Pancheshwar Dam Project is yet to be constructed. Among the three Projects, Pancheshwar is a multipurpose Dam Project generating more than 6000 MW of electricity and irrigation to more than one million hectares of land in India and about 94,000 hectare of land in Nepal. The project benefits also include flood control. The project is to be constructed on the river Mahakali which forms border between the two countries. This agreement has established following principles:

- Power 50 % to each country.
- Nepal to get 50% of the water of which it shall use for irrigating of 94 thousand hectares of land. The rest shall flow to India. The benefits which India is going to

get due to extra water shall be assessed and be charged to India for the construction of the Project.

- India shall pay for the flood control benefit also.
- Mahakali Commission shall be established for the implementation of the Project.

The Project Report has not been completed because of the differences between the countries on the calculation of benefits to India and its share in the cost. Although the agreement was concluded in 1996 detail Project Report for Pancheshwar has not been completed. However, other components of the Agreement like Sarada Barrage and Tanakpur power house are in function and India is getting benefits out of these projects. Nepal's benefits from these projects are meager. From delayed tactics, it looks as India does not want to construct the Pancheshwar Project. India is already getting almost the entire water of Mahakali River and using it through Sarada Barrage and Tanakpur power house, the first of which was constructed under agreement and the second was unilaterally constructed by India on the face of Nepalese opposition. Apart from the above three projects, both the countries are in negotiation on water resources for the last 30 years without much success. India keeps on re-interpreting the Treaty clauses to its advantage which are constantly being challenged by Nepal. This Treaty could have formed a good example of benefit-sharing had India struck to the original clauses and the spirit behind these clauses.

Treaty between India and Bangladesh[3]

India constructed a barrage at Farakka on the upstream of the Ganges and started withdrawal of water on the basis of an ad-hoc agreement signed on 18 April 1975. In this agreement, Bangladesh gave consent for withdrawal of 11-16 thousands cusecs water from April 21 to May 31, for a limited period of 41 days. In return India promised that rest of the water will flow through Bangladesh. But after the expiry of 41 days period, India kept on withdrawing water in the lean period of 1975 and 1976. In April 1976, the flow of water at Hardinge point

came as low as 23,000 cusecs against 65,000 cusecs of the corresponding time of previous years.

India signed a 5-year water-sharing treaty with Bangladesh on 5 Nov 1977. The Treaty had a Guarantee Clause for getting 80% of the flow during lean period and an arbitration clause. After the expiry of the Treaty in 1982, India refused to renew/extend the time period.

Then on October 1982, a two-year mutual agreement followed by another three years agreement (on Nov 22, 1985) was signed between the two sides. But in these two agreements, the Guarantee and Arbitration clause of 1977 Treaty were withdrawn. After that on 12 Dec 1996, a 30-year Water Treaty was signed between India and Bangladesh. This Treaty was also devoid of the Guarantee and Arbitration clauses. After the 1996 Treaty, during the lean period, for the last few years, the flow of water at Hardinge bridge point comes down to 10,000 cusecs, even sometimes as low as 5,000 cusecs.

Adverse Impacts of Farakka Barrage

The main environmental problems already created due to withdrawal and diversion of water through Farakka Barrage may be summarized as follows:

- Due to continuous withdrawal of water through Farakka Barrage for the last 31 years, a significant number of rivers in the Padma basin of Bangladesh have already turned into dead rivers. The Garai, a pre-Farakka mighty river now is almost dead. In pre-Farakka days, during rainy season, the maximum flow of water through the Garai used to be in the range of 142,000 – 328,000 cusecs, now it has become a memory of the past. According to a report of Water Development Board, 17 rivers in Bangladesh are already dead. Many rivers are nearly dead.

- During the dry season when water is much needed in all areas of Bangladesh, in particular for the irrigation

of 200,000 hectares of land under the Ganges-Kobotak project, water becomes almost non-available. The Ganges-Kobatak (G.K) is the largest irrigation project of Bangladesh. It supplies water from the Padma (Ganges) to 300,000 acres of land. The project consists of 120 miles long main canal, 292 miles long branch canals and 62 miles long sub-branch canals. But scarcity of the Padma water has made the project ineffective. Agriculture in a vast area of Kushtia, Hessore and Faridpur regions comes to a standstill in dry season. Most of the 113 tributaries of the Padma become dry or have scarce water from November – May. The water sharing of the Teesta River, ended without any agreement although many meetings were held. The Teesta River near Teesta Bridge looks like a part of a desert during dry season. A vast area of land once a grainery of Bangladesh has become desert and a food-deficient area now.

- When excessive rain in the upper Ganges basin and ice-melt water creates pressure on the barrage due to abnormal rise of water, India opens all the sluice gates. Then the sudden on rush of water causes floods in Bangladesh or increase the intensity of floods.

- During the dry season (water-scarce period) the irrigation system based on shallow-tube wells suffers adversely due to the considerable downward shift of the ground water tables (3-15 meters). On the average, every year the ground water tables are lowered by about 5 meters which is recharged from rain water and normal flooding.

- As a result of the diminished flow, the intrusion of sea water in the southern part of the country, particularly through the Rupsa River, on the bank of which is located one of the major industrial cities, Khulna, has become so pronounced that the salinity has gone up more than 60 times then the pre-Farakka times.

Increase of salinity in such magnitude has significantly altered the ecology of the region.

- As an adverse effect of the Farakka barrage, many places of the Murshidabad District of the West Bengal has been suffering from serious water logging.
- In post-Farakka period, the ground water in many places of West Bengal is registering very high arsenic content, since then the ground water of the district Rajshahi, which is adjacent to Farakka is also shown high arsenic content.
- The interrupted and diminished flow of the Ganges has also caused disturbances in the normal sediment transport. As a consequence, the Ganges flood-plain in Bangladesh is being deprived of the natural supply of the micro-nutrients.
- Desertification syndromes have already started in the north-eastern part of Bangladesh as a consequence of the withdrawal of water through the Farakka Barrage.

By the adverse impacts so far created, on the environment and ecology of Bangladesh by Farakka Barrage, it is logical to term it 'a undeclared environmental war against Bangladesh'. But it is pertinent to note that very purpose for which this dam was constructed is defeated. The Farakka Barrage is popularly known in Bangladesh as "Death Barrage".

Inter-basin River Linking Project[4]

India is now implementing a gigantic project, 'Inter-basin River Linking Project' to divert water from all the common rivers. This project has two components i.e. (i) the Himalayan components and (ii) the Peninsular component. In the Himalayan component 14 link canals and in the Peninsular component 16 link canals, all together 30 link canals will be excavated within the frame work of the project.

India in its river interlinks project aims to connect 37 rivers by 30 link canals. The total length of these link canals

would be approximately 12 thousand kilometers. The breadth of the link canals have been proposed to be 50-100 meters and the depth to be approximately 6 meters.

The upstream withdrawal of water through Farakka Barrage has already started desertification syndrome in Bangladesh, intrusion of salinity in the inland fresh water and created many serious environmental problems including the bio-diversity loss. In addition, if India executes the inter basin river link project, then Bangladesh known all over the world as a land of rivers, fish and rice and a beautiful green land will lose all its present identity.

There are international protocols for sharing of common rivers flowing through more than one country. It is mandatory to supply the data of the flow of water through a river, its courses, the environment and ecology of the river bank and catchments area and bio-diversity of the country to the country or countries sharing the same river. But India is not supplying any information about its on-going inter basin river link project to Bangladesh.

The rivers included in the inter basin river link projects are all international or common rivers between India and Bangladesh. Therefore, unilateral construction of any barrage on upstream, withdrawal of upstream water and change of river course are definitely in violation of the international laws.

India's Latest Policy Document[5]

India's latest thinking on Transboundary waters is amply reflected in a recent report by Institute of Defense Studies in India (IDSA 2010) on water security and elaborates the increasing attention to water issues within a broader geographical context.

While reviewing India's bilateral water relations with neighbouring countries, country by country, the report notes that if not managed well, riparian issues will lead to increased conflicts. It calls for a paradigm shift from the historical

supply side considerations in domestic and international agreements, and past investments focused on water sharing among competing interests, to one that focuses on benefit-sharing. It stresses that rivers can no longer be viewed as a "soft-component" of a country's foreign policy. Rather they must be seen as intricately linked to development goals and domestic needs impacting bilateral relations. The report goes on to say that while it is important to adopt sensible riparian policies and 'healthy rivers' schemes, there is a need to re-evaluate existing treaties and reframe them based on current hydrological knowledge and future mutual needs. India's geographical contours place multiple upper, middle and lower riparian systems within its borders – thus placing it at the epicenters of riparian politics. Therefore, collaborative riparian management will be crucial for setting many of the water induced conflicts in the region; greater hydro-diplomacy both internally and across national borders – will need to balance the region's growing water needs with larger security concerns.

The gist of this policy document is described hereunder:

- The Policy while reviewing India's bilateral relations with neighbouring countries, country by country, notes that if not managed well riparian issues would lead to increased conflicts.

- It calls for a paradigm shift from historical supply-side considerations in domestic and international agreements, and past investments focused on water sharing among competing interests, to one that focuses on benefit-sharing.

- It stresses that rivers can no longer be viewed as a "soft component" of the country's foreign policy. Rather they must be seen as intricately linked to development goals and domestic needs impacting bilateral relations.

- The document goes on to say that while it is important to adopt sensible riparian policies and healthy river schemes, there is a need to re-evaluate existing treaties

and reframe them based on current hydrological knowledge and future mutual needs.

- The policy document places India at the epicenter of riparian politics due to its geographical contours as multiple upper, middle and lower riparian systems lie within its borders.

- The document goes on to suggest that collaborative riparian management will be crucial for settling many of the water induced conflicts in the region. It emphasizes greater hydro-diplomacy – both internally and across the national Borders – that will be essential to balance the region's growing water needs with larger security concerns.

Evolutions of International Water Laws[6]

The International Water Laws since then have constantly gone under evolutions to reflect current understandings, which recently are more oriented towards the promotion of cooperation rather than conflict, encouraging interest-based prospects rather than positional discussions and negotiations. The primary role of the Law in this context is to enable determination of each state's equitable and reasonable "entitlements" to the benefits of the use of Transboundary waters and to establish certain requirements for state's behavior while managing and developing the resource. To prove that benefit-sharing paradigm is really a good idea, it will become incumbent on the water resources management practitioners to demonstrate the material benefits and positive-sum outcomes to adhere to its principles. This is essential in creating confidence in the stake holders on both sides of the divide.

Commenting on International Water Laws and IDSA Task Force Report in the Oct-Nov 2010 publication of Dams, Rivers and People, New Delhi; the importance of role of water in the national and regional politics is summed up as quote "Resource nationalism will increasingly dominate the

hydrological contours of South Asia and will largely define regional politics."

"The hydrological contours of India, both as an upper riparian and a lower riparian, will be the epicenter of new riparian politics and diplomacy over transboundary rivers --- India's riparian relations with its neighbours will become progressively fragile with Pakistan, Bangladesh and Nepal continuously raising concerns over regulating and sharing of river waters."

"International Water Laws on allocating water within river-basin are difficult to implement and often contradictory".

The UN Convention on Non-Navigational Uses of International Watercourses approved in 1997 by a vote of 104 to 3 (but not yet ratified) requires watercourse nations (Article 5) to participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Burundi, China and Turkey (upper riparians) voted against the Convention. India (middle riparian) abstained. While Bangladesh (lower riparian) voted for, Pakistan abstained. Of the other transboundary South Asian states, Nepal voted for and Bhutan was absent. The Convention was adopted by a vote of 104 in favour to 3 against and with 27 absentees.

From India's acts and approaches, it becomes quite obvious that India would not honour International Water Laws and would not respect the existing treaties. India in International Forums have repeatedly indicated that under water stress situation and climate change impacts, the existing treaties would become irrelevant.

Existing Water Disputes between India and Pakistan

Wular Barrage and Tulbul Hydropower Project

India's projects of Wular Barrage and Tulbul Hydropower on the river Jhelum have been objected by Pakistan as

violation of Article (II) of the Treaty which prohibits both parties from undertaking any man-made obstruction that may cause "change in the volume of daily flow of waters". Further that Article III (4) specifically barred India from "storing any water of or construct any storage works on western rivers". India is allowed "incidental storage" on western rivers on its side under Article 8(h) of the Treaty only after its design has been scrutinized and approved by Pakistan and its storage capacity does not exceed 10,000 acre feet.

Both Wular Barrage and Tulbul Project have implications on Pakistan's water availability during the low water season, when river flows are reduced to one fifth of the summer flows. There are chances of serious threat to Pakistan, if India decides to withhold water over an extended period during the dry season. It would also multiply the risks of floods and droughts.

Mangla Dam also on river Jhelum which is a source of irrigation and hydropower for Pakistan would be adversely affected. Similarly Kishenganga Project on river Neelum would also affect the Nelum-Jhelum hydropower Project of Pakistan.

The issue of Wular Barrage has been one of the disputes highlighted for India-Pak talks.

Kishenganga Hydropower Project

India plans to construct a 103 meter high dam on the Kishenganga River in Gurez Valley creating a large reservoir from a channel and a 27 km tunnel dug South through the North Kashmir mountain range, will redirect the Kishenganga (Neelum) waters to the Wular Lake at Bandipur. Total distance by which the river will be diverted is 100 km. the project would generate 390 MW of hydropower.

India's project being on the upstream of Neelum River will affect the flow of Neelum River on which Pakistan is also constructing a 696 MW Neelum-Jhelum Hydropower Project with a tunnel of almost 47 km. India on the other hand claims

that it is within its rights to construct the Kishenganga Project has been working on it since 1980s. According to the Treaty, the country that completes the project first will have priority rights over the water uses. So far the Indus Commission has had numerous meetings but unable to resolve the issue. The opinion of International Arbitrator and the referring it to International Experts are being considered by Pakistan.

Baglihar Dam Project

This project is located at Chander Kot about 160 km north of Jammu on Chenab River. In Pakistan's view, the hydropower plant on Chenab River is a clear violation of the Treaty and a clear violation of International Water Law. The Baglihar Dam Project was planned in two phases and first phase was completed in 2005 and the second phase was completed in 2008. As per design, the Baglihar Dam is 143.3 m in height, 317 m in length with a design storage of 30,000 acre feet. According to Pakistan's stand, design of Baglihar Dam violates the Treaty, as it will affect the flow of Chenab River that will cause shortage of water in Pakistan.

Pakistan and India held numerous meetings without any outcome and finally Pakistan requested the World Bank for appointment of a Neutral Expert in May 2005. The expert gave his verdict on February 12, 2007 in which he partially upheld some of the objections of Pakistan. The crucial decision was allowing India storage upto 26,000 acre feet to flush sediments.

Since India is planning almost 33 hydropower projects on western rivers and if the decision of Neutral Expert is applied to all the future storages by India on western rivers, it will have catastrophic consequences for Pakistan as India if resorted to filling these reservoirs during low water season, the accumulative affect of it could destroy the Rabbi crops in Pakistan.

A Way Forward[7]

Moving forward with particular thinking or mind set can never see the end of the path. The complexities of issues, lack of political wisdom and will, positional based stands, high level of mistrust, linkages to Kashmir issue, negative public perceptions and deep buried hostilities offer formidable obstacles to cross. Any move forward will require a deep analysis of the mind sets on both sides. India's past history, its respect for already executed treaties and its recent thinking have to be taken into consideration. Whereas India suggests to adopt a paradigm shift from conflict to cooperation and from water sharing to benefit-sharing, its hegemony in declaring itself as at the epicenter of riparian politics due to its geographical contours tantamount to a warning to other riparian countries. India is suggesting to re-evaluate the existing treaties and reframe them on current hydrological knowledge and future mutual needs. Apparently one can say, India's thinking is in line with the current concepts on Transboundary water issues and in conformity with the International Water Laws but at this point of time, benefit-sharing has very limited international experiences and relatively a new approach. It is a complex issue with multiple parameters to be addressed including economic, social, environmental and political gains. Under these circumstances, the way forward is to honestly implement the existing treaty in its true spirit.

Issue that can be Addressed Bilaterally[8]

- To remove mistrust on data exchange, satellite based data collection system should be installed for real time data information. Cost of such system should be shared by both the countries.

- Since storage for flushing sediments has already been allowed to India, its timing is crucial for Pakistan's agriculture. This should be addressed bilaterally and can be resolved amicably once real time data becomes available. Otherwise with multiple hydropower stations

being constructed by India numbering 33 on the western rivers with cumulative storage can impose major reductions on water availability in Pakistan during the critical planting season.

- Since hydropower does not consume water, the only issue is timing, and timing is a crucial issue because agriculture in Pakistan depends not only on how much water comes but that it comes in critical periods during the planting season. Under normal and trustful relations India could increase low-flows during the critical planting season with significant benefits to Pakistan and small impacts on power generation in India.

- Presently there is a very uneven playing field. The regional hegemony is the upper riparian and has all cards in its hands. The Institute of Defense Studies in India has clearly and in unambiguous terms has identified India as the "epicenter of riparian politics". This asymmetry means that changes must start in India. India therefore would need to have some courageous and open minded Indians who realize and explain to the public why it is essential and vital issue for Pakistan.

- If there is goodwill, there are multiple ways in which the treaty could be maintained and interpreted so that both countries could win. Otherwise both countries would be dragged into unending processes of litigations. India looking for grey areas in the treaty and Pakistan on the offensive with development on both sides having negative impacts leading towards serious conflicts.

- Discussions on Indus Waters Treaty should be delinked from both historic grievances and from the other Kashmir related issues, both sides showing a sign of statesmanship, and moving forward considering water as catalyst for development and not a resource for conflicts.

- Climate change impacts: Various models indicate that global warming can accelerate glacier melt with the result that additional water would flow in rivers originating from Himalayan ranges. Since treaty stipulates average flow to be released to Pakistan, India can easily divert this additional water either for direct uses or filling up the large number of storage dams without letting Pakistan to benefit from this additional water. This issue could be taken up with India with positive suggestions to work out a joint climate change adaptation strategy in combating droughts and floods where water shortages and surpluses are jointly managed with minimum negative impacts on both countries.

- Bilateral development of Kabul River: Similarly Pakistan and Afghanistan should also adopt a strategy in developing the water resources of Kabul River jointly and protecting Pakistan's historic rights on water uses. This is also a priority area where Pakistan must initiate dialogue with Afghan Regime as soon as possible.

Issues which can Attract International Support and Understanding[9]

- **Environmental Flows to Maintain River Biodiversity:** India, during low-flows, diverts almost 100 percent of the waters of three eastern rivers leaving vast stretches of rivers within Pakistan's boundary completely dry. This violates the International River laws where environmental flows and maintaining rivers health is mandatory for the riparian states. IUCN, WWF, GEF, UNEP, UNDP and many other organizations are strong advocates of such issues. Pakistan can raise this issue with these organizations and in the international forums.

- **Transboundary Aquifers:** Another emerging issue on water and benefit-sharing is the maintenance of Transboundary groundwater aquifer. India with low power tariff has encouraged installation of tube wells in

Eastern Punjab and other bordering states with Pakistan with the result that ground water aquifers within Pakistan are over-mined by India. This issue can also be raised in the international forums with favourable reaction. International conference on Transboundary aquifers was recently held in Paris, France on 6-8 Dec 2010 organized by UNESCO to address issues of shared aquifers.

- **Transboundary Water Pollution:** The natural slopes facilitate the flow of untreated effluent from East Punjab to West Punjab. Under international water laws riparian states are required to ensure untreated effluent is not discharged into rivers, natural *nullahs* etc. This is again a justified issue and that Pakistan can raise in the international forums with favourable reactions.

National Water Management[10]

A point to be noted is that good geopolitical management however, is only possible when countries successfully manage their myriad domestic water challenges. Currently complex national level issues of food, water and energy tend to be addressed in a cylindrical fashion by sector focused ministries when cross sectoral analysis and solutions are urgently needed. Pakistan therefore, needs to address its domestic water challenges seriously in an integrated and coordinated manner. Every drop of water needs to be utilized most judiciously to achieve more food, more value and more jobs. Pakistan needs to correct its direction on top priority basis in managing national waters; else its position on Transboundary negotiation will remain on weaker wicket. The dismal water management statistics such as 132 cubic meter per capita storage against America's 6,150 m3, Australia's 5,000 m3; carry over capacity of only 30 days as against 1000 days of Egypt; Contribution of 34 cents by one cubic meter of water to the GDP against developed countries of US$ 30 to 40 and wasting precious water resources to the tune of 1334 billion cubic meter value at US$ 158 billion into sea over the last 32 years makes Pakistan's case extremely difficult for securing

any international support. Pakistan is also one of the few countries in the world which does not have a National Water Policy. Pakistan's total hydro power potential is close to 100,000 MW. Pakistan has developed only 6500 MW i.e. 6 percent only. As against this India has constructed 4,700 medium to large dams and created a carry over capacity of 220 days. India's productivity is three time more than Pakistan and a unit of water contributes about US dollar 4 to Indian GDP. Total hydro power potential of India is 148,700 MW out of which India has already developed 31,000 MW and over 50 hydro projects are under different stages of development. India's share of coal in the overall energy production is 69 percent whereas Pakistan's share is only 1 percent in spite of having one of the largest coal deposits in the world. India plans to create additional 180 BCM of storage volume by constructing some 2,500 dams by the year 2050. Pakistan therefore, needs to have a paradigm shift in its overall water management strategy.

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Notes

[1] Sardar Muhammad Tariq, Regional Chair, Global Water Partnership – South Asia (GWP-SAS), Islamabad, Pakistan.
[2] Surya Nath Upadhyay – Mahakali Treaty: The View from the Negotiating Table.
[3] Professor Dr. Jasim uddin Ahmad, Mostafa Kamal Majumder – Regional Cooperation for Sharing Transboundary River Water.

[4] Sardar Muhammad Tariq, Regional Chair, Global Water Partnership – South Asia (GWP-SAS), Islamabad, Pakistan.
[5] Institute of Defense Studies and Analysis (IDSA) (2010) Water Security for India: The External Dynamics, New Delhi: IDSA.
[6] Sardar Muhammad Tariq, Regional Chair, Global Water Partnership – South Asia (GWP-SAS), Islamabad, Pakistan.
[7] John Briscoe. Water or Peace on the Indus. The News International. April 03, 2010.
[8] Sardar Muhammad Tariq, Regional Chair, Global Water Partnership – South Asia (GWP-SAS), Islamabad, Pakistan.
[9] Sardar Muhammad Tariq, Regional Chair, Global Water Partnership – South Asia (GWP-SAS), Islamabad, Pakistan.
[10] Sardar Muhammad Tariq, Regional Chair, Global Water Partnership – South Asia (GWP-SAS), Islamabad, Pakistan.