

PREAMBLE: India's water war is no longer surreptitious. It is blatant. It is now a cold-blooded campaign. Her transparent interference internally in Pakistan has created an anti-dam lobby within the three smaller provinces. Their open opposition to a second reservoir on the Indus after commissioning of Tarbela Dam (1974) has been suicidal for Pakistan's economy. Punjab, Pakistan's largest populated province and breadbasket has seen its agricultural output stagnate. No thanks to Pakistan's rising population the per-capita agricultural output has fallen in real terms. Poverty & the resulting tensions within the Federation have multiplied. India's internal factor (in Pakistan) & external activities (in Kashmir) have inflicted upto 2010 a financial loss of over a trillion USD equivalent to the PAK economy. Potentially the richest nation of South Asia is now a basket case. Due to Pakistan's failure to build multi-purpose dams (after 1974) the desired hydel:thermal ratio has become lopsided; around 30:70. Imported oil based power generation can never be sustainable. A terrible energy crisis has enveloped the entire economy. The financial deficit has climbed above USD 10bn for the first time. The national debt servicing is even greater. Textiles its dominant agro based sector has not grown in real terms.

India now goes ahead with plans to build 100 + hydro-electric projects on Pakistan's waters flowing through Indian Held-Kashmir; the so-called three western rivers: Indus, Jhelum & Chenab. She uses a benign concession in the landmark Indus Waters Treaty of Sep 1960 to justify building dozens of high dams & creating reservoirs in cascade. She could build some run-of-the-river hydro-electric power plants using diversion thru weirs & power tunnels. Equally disturbing is India's claim on the waters that Pakistan's anti-dam lobby compels it to waste. She is building the world's largest single irrigation project using a network of canals between Indian Punjab & Indian Bengal predicated on diversion of Kashmir waters. Blueprint for history's greatest genocide? Pakistan was facing the inexplicable scenario of drastically shrinking inflows from her western rivers. This coupled with drought like conditions upto late July 2010.

Floods such as the apocalyptic one in 2010 can also be made into a net gain for the economy. Assuming we had a storage of around 30 to 40MAF instead of the depleted 11MAF total storage available (the high being 17MAF in 1974) the flood peaks would have been attenuated and generally contained. Overflow of banks in the plains of Punjab & Sindh would have been manageable. Above all a bounty of sweet water stored for the economic growth of the people. Every MAF wasted is a +USD 2Bn loss to the economy. An unforgiveable sin for a nation that boasts the world's largest contiguous manmade irrigation system (IBIS) at its disposal.

Proposed KBD & floods: Tragically our hydel development has been dismal and the mega reservoir projects are virtually on hold since Tarbela Dam (1974). The surface storage is now less than 8% of the average 145MAF annual flows. An agrarian economy such as Pakistan should have achieved atleast 30MAF (20%) storage. India would soon achieve 40% of its annual surface flow of 750MAF. Indeed the per capita flow of both neighbors are similar. In 2008 & again in 2009 Chairman WAPDA a non-technical bureaucrat clearly advised the Federal Minister to announce the official closure of the Kalabagh Dam project (KBD) and WAPDA House was the venue for this tragic announcement. Does a nation, a town, a village, a home require "consensus" for its sweet water supplies? Water is life and only an enemy will disagree. Reservoirs are indeed also the lowest cost electric energy resource. All emphasis is now on a solitary project, the Diamer Basha Dam (DBD) which is already an object of Indian inspired intrigues. DBD present design is a treacherous & dangerous attempt to eliminate KBD.

Delay in KBD construction is a staggering wastage of around USD 230bn equivalent between 1990 and 2010. A second reservoir on the Indus capable of +6MAF storage which would have compensated for the depletion of PAK reservoirs since the commissioning of Warsak, Mangla, Tarbela & Chashma & could have kept our economic growth far ahead of our population increase. Only KBD met the criteria for a quick & cheap replacement reservoir to offset the

storage capacity lost. A near hopeless sociological situation as seen today would have been averted. The floods of July/Aug 2010 have shown that KBD would have complemented Tarbela Dam's intrinsic flood attenuation & mitigation capabilities. The construction of proposed Munda Storage project on The Swat River would also have been helpful for flood control. The 1.2MAF storage at Munda so close to the population centers is capable of providing around 1.5Bn units/year. The Munda - KBD conjunctive operation presents a wonderful opportunity for inter-provincial cooperation. The energy output of KBD could increase by around 250GWh (0.25Bn units) at average head of 200 ft, due to Munda Dam. Flood attenuation is another major bonus.

Tarbela clearly moderated the floods of main Indus stem by 250,000 cusecs thus not allowing the flow at Jinnah Barrage to exceed one million cusecs; a flow that would have been catastrophic for all barrages downstream including the creaky Sukkur Barrage. Major reservoirs have three purposes viz, Irrigation Water, Electrical Energy & Attenuation of Floods. Nowshera was seriously affected by flood in Kabul River. Kabul River is a major tributary of River Indus which joins it about 4km above Attock gorge. It starts from Chitral, flows to Afghanistan and again enters into Pakistan near Warsak passing through Peshawar & Nowshera valleys. It merges with Swat River upstream of Nowshera before joining the Indus, downstream of Nowshera city. The heavy rainfall in end July 2010 created the excessive flash flows in Chitral, Swat, Panjkora, Kalpani rivers etc (all tributaries of the Kabul). The flood measurement gauges of WAPDA were drowned and washed away at its Nowshera flow gauging station. Flows at Nowshera were about 250,000 c/s on 29 July 2010. The river later peaked at about 400,000 c/s. Unprecedented rains in Tarbela catchment near Pattan, Gilgit and Gupis created exceptionally high flow conditions at Tarbela (840,000 c/s) resulting in outflow of around 605,000 c/s on 30 July 10. This in combination with outflow of 400,000 c/s from River Kabul & 70,000 c/s of Kalpani River should result in 1,075,000 c/s flow at Khairabad but due to Attock Gorge backwater affect it was 995,000 c/s. If KBD had existed with the reservoir level initially at about 820ft & if the irrigation requirements had been met also at Chashma Barrage (downstream of KBD) it would have achieved its maximum conservation level of 915ft around early August 2010 when outflow at Tarbela was around 390,000 c/s & Kabul River + Kalpani around 120,000 c/s. Cumulative flow at Attock Gorge would have been about 510,000 c/s. KBD would have kept its outflow at a range of 240,000 to 600,000 c/s and maximum level of reservoir would have been about 878ft. If required KBD could have allowed a maximum discharge/outflow of 1,200,000 c/s. Compare this with the maximum floods of 995,000 c/s reaching Khairabad on 30 July 2010. How a backwater situation could have been created due to the existence of the proposed KBD reservoir? Is it not a national tragedy that Chairman WAPDA & his Member Water continue to harp on their deadly hypothesis that if KBD had existed the flood damage would have been greater!? The real cause of flooding at Nowshera and Peshawar valleys upstream are; entrance of Kabul River at Nowshera into a confined channel (gorge) at the end of the wide Peshawar valley and backwater affect of Attock Gorge downstream through which Indus River has to pass after its confluence with Kabul River. Indus River flows through a wide valley of over 8,000ft and is then forced to pass a 1,000ft wide gorge for about 8kms. This constriction forces the river water to backup thus giving rise to flood levels in Kabul River. Flooding of Nowshera city is due to one gorge at Nowshera & a second at downstream Attock. Proposed KBD site about 160km downstream of Attock with a live storage capacity of 6.1MAF & max conservation level 915ft (asl) will act (similar to Tarbela) as a downstream flood mitigator.

DBD: I refer to the WRDC website for the three letters of 2004 of late Dr. Ghulam Safdar Butt (Lt. Gen Retd) to General Pervez Musharraf. Now Dr. Butt was heavily critical of the feasibility report prepared by lead consultant M/s Nespak - MWH/ Harza & others known as the NEAC consultants JV. Very critical of the 281m height of the Roller Compacted Concrete (RCC) design. About 49m would be below the river bed for its rock bed support. He had observed that an attempt to build the world's highest RCC dam in the region of severe seismic history was playing with fire & inviting disaster. The NEAC JV however had chosen an economical site

location. Cost was estimated at USD 6.45bn including downstream upgrading & upstream relocation of the KKH & environmental mitigation measures. A few lines from Dr. Butt's letter "This is a dangerous area to build a dam. The prosperity and survival of the country depends on this and other dams. Geology of the area has not been fully studied. Jaglot syncline is a highly active tectonic element. Basha is located within its stress field where tectonic movements are permanently going on. Frequency of heavy earthquakes is considerable. Their epicenters are not too far. More detailed & precise investigations are necessary. Recent 2002 earthquakes in Nanga Parbat Massif (NPM) can initiate several landslides. If that happens after the dam is built & a wave is generated that may fail the dam & spill over it. The downstream devastation to Tarbela and all other barrages, upto Kotri would be enormous. I shudder at the thought". On 08 Oct 2005 Dr. Butt apprehensions based on his thirty years pioneering work on the KKH were proven correct. Renowned National Centre of Excellence in Geology, University of Peshawar's paper from 2002 (Authors Mohammad Riaz & Ghazanfar Khattak) reference to DBD covers "reservoir induced earthquakes" as a very real phenomenon. These are classified as triggered or induced earthquakes. This doc will be placed on the WRDC website.

Indian mischief has blocked IBRD financing for DBD by linking Northern Areas with a "Greater Kashmir" thesis. The overlapping tragedy being that WAPDA selected a new set of dam consultants who disregarded the NEAC JV site location and chose a much wider site about 2km downstream. The width/volume of the dam structure doubled as a result. The cost also doubled. Diamer Basha Dam site offers no construction inputs, locally. Explanation for this catastrophic change is the location of a steep granite embankment on one bank of the NEAC JV site. Till today we have understood that granite embankments are desirable but the Lahmeyer led JV of Design Consultants went ahead with this disastrously expensive site change. In-house adviser Dr. Izhar, a retired WAPDA engineer succumbed to the pressure of the Lahmeyer JV. In the interim the World Bank had blacklisted Lahmeyer due to malpractices in Africa. Even this did not deter Dr. Izhar and his boss the new incumbent WAPDA Chairman Mr. Shakil Durrani to revert back to the economical design of NEAC JV consortium; duly outlined in their detailed Feasibility Studies of August 2004. If the site change is due to consideration of tariff / Royalty sharing between GB province & KP province then it is a terrible shame. Chairman WAPDA is advised to learn about the Royalty formula proposed to the Federal Ministry in 2006 by the venerable Engr. Shams-ul-Mulk, a highly respected WAPDA officer whose tenure as WAPDA Chairman (in the 1990s) will always be remembered with the same reverence as the tenure of Lt. Gen. Dr. G. S. Butt (1981 – 1987). Location of power house is a minor royalty factor (15%). Another national tragedy was being enacted & the people of Pakistan were kept ignorant. Heed the words of Dr. G. S. Butt and revert to the original NEAC site location & reject the wider Diamer Basha Dam design. Lower the dam height to about 230m above rock bed as per demand of seismic realities. Have one power house, if still feasible. Save funds & build KBD within 5 years as well in the same costs as the Lahmeyer JV designed DBD. It will be possible to construct the narrow DBD as per NEAC JV feasibility within 7 years (instead of 10 years). Will the Indian lobby in Pakistan allow the reversal? DBD must be built as a smaller, safer dam whose reservoir would also be a sediment & debris trap for a part of the 160mn tons that reaches the Tarbela reservoir every year. Life extension of Tarbela Dam is very desirable. DBD will allow incremental energy at Tarbela of atleast 1,450GWh (1.45Bn units/year). DBD must not become a source of seismic initiation & catastrophic flooding in the words of Dr. Butt.

Akhori: Off-channel storage is a revolutionary idea, which needs to be studied. It is not a replacement for the KBD but one day it could supplement the Tarbela reservoir. Of course there is negligible power generation element in Akhori. Flood mitigation would be possible.

WAPDA weakened by design: It is modeled on the TVA which is America's most successful civilian project. The willful destruction of its balance sheet is a national calamity. It was only eight years ago when the Indian Army COAS declared and translated verbatim "Every proposal

in opposition to Kalabagh Dam is like a new nail in the coffin of Pakistan's defense capability". Soon thereafter a three member Indian delegation to an Islamabad conference declared that Indus Waters Treaty 1960 is redundant & superfluous! Not a single PAK functionary reacted. It is quite apparent that the induction of non-technical bureaucrats in engineering organizations has been a major factor in the nation's economic plight. In WAPDA's nascent developing stages it was fortunate to have had visionaries such as Ghulam Ishaq Khan, Ghulam Faruque Khan & I. A. Khan. Bureaucrats trained to seek advice & work as a team. They analyzed the financial impact of a decision. Today the seat of Chairman WAPDA has been reserved for a political group whose declared policy is "No more reservoirs on the Indus". No wonder the Chairman does not spend more than a week in Lahore. He demands that the 96MW Jinnah low head project be expedited while the 3,600MW KBD, few km upstream is willfully forgotten.

CIBSA; Global warming & the water bomb: Comrades are requested to study the WRDC article on proposed CIBSA as a counter to the ICID menace at www.wrdc.com.pk. The floods 2010 have confirmed that our Sindhi brothers' infact drink surface waters (river canal & lake) inspite of the chemical pollutants. Their ground water is generally brackish & full of pathogens; unfit for human consumption. The nation will have to build several mega dams in cascade. Hydraulic efficiency & energy output of all three dams would be greatly enhanced if DBD – Tarbela – KBD cascade is available giving a bounty of over USD 50Bn per year. Pakistan needs a think tank for its hydrologic analysis. The inter-provincial water disputes became manageable after the Water Apportionment Accord (WAA) in March 1991 & the creation of IRSA as a result in 1992. However both PCIW & IRSA lack the required punch due to deficient technical depth & commitment. In the case of PCIW secretariat it is shamefully under-equipped to face a diabolical, merciless & relentless upper riparian neighbor. PCIW must not depend on Indian data. The Indians clearly worship a water-god as their actions have shown since 1946.

CONCLUSION: WAPDA the economic backbone of Pakistan has to be made viable. The intelligentsia must play its role in building public awareness on the "Greater Kashmir" game which has blocked our mega projects. KBD is a quick & economical lifeline for Pakistan and has to be built at all costs. It has a perfect location for both irrigation & energy production. Pakistan's storage capacity is about 8% of its annual surface flows of 145MAF. Pakistan needs water for its agricultural & energy needs. A national objective of atleast 30MAF has to be achieved within 15 years. This would be around 20% of its total surface flows, annual average. Substitution by imported energy (oil) is not sustainable. The national objective has to be an annual increase of 12% in the surface storages for the next 15 years and within 10 years to achieve the desired Hydrel:Thermal ratio of 70:30 from Hydro Reservoirs & Run-of-River projects. Our sovereignty is at stake. In fact whichever part of Pakistan will be denied Indus Waters its economic growth will be nearly impossible & extremism will follow. The recommendation for creating CIBSA (Commission of Indus Basin Strategic Analysis) must be looked at by all of us. Indians created ICID in 1950 & today we have to face this monster without the tools. PIWC & IRSA are toothless organizations. A strategic think tank becomes vital.

Therefore it is clear that the WAPDA Member Water clearly supported by his Chairman has spent the last nine months in three major official activities: talking to funding agencies for the construction of the "go-slow" Diamer Basha Dam. Indian inspired "Greater Kashmir" linkage inhibits the World Bank from participating. Secondly they spent considerable time & resources to justify their decision on the never to be built KBD using an absolutely anti-national approach. They insist KBD would have increased the flood damage. Thirdly they spent time & effort seeking justification through their human moles to purchase mechanical moles (TBMs) for the Neelum Jhelum tunnel program on the false pretext of a race. It is time to end tyranny & defeat the Indian inspired anti-dam lobby within Pakistan.

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