WAPDA Sinking. Entire water sector on the brink!

Preamble: The bureaucracy, have become complete masters, in matters of energy and water. Pakistan's bureaucracy has consistently got it wrong, and their mistakes, some intentional and some ignorant, might cost the country everything if haste is not made. We have not built since 1974 a new water storage on the Indus for Irrigation & hydroelectric generation. At least 50% of our water needs are taken from Ground Water. No attempt has been made to recharge the highly contaminated aquifers or to stop the rot and rejuvenate our industrialization base that has been shrinking. The 1994 imported energy policy resulted in a shrinking GNP & negligible export growth. In the 20th century the world witnessed a watershed in economic development. Mergers & acquisitions meant higher efficiency and financial strength. We as a nation decided in the 1990s to breakup WAPDA, our "Economic Headquarter" responsible for development & operation of our main asset i.e. water. The public sector thermal generating plants as well as the transmission networks were spun-off. The fallout of the 1994 IPP policy based on imported energy has been poverty & elimination of local manufacturing initiatives. Expensive energy has unbalanced all economic indicators. We hear of a CCI decision taken on 23 Dec 2019. It relates to Recruitment Regulations for WAPDA's corporate governance (of WAPDA) after its "restructuring" in consultation with the provinces etc. This is the second attempt to liquidate WAPDA and corporatize it after the failed attempt in Oct 1998. The bureaucrats are at it again. More reason to understand that WAPDA is a strategic organization; our Economic HQ and not open to tinkering & corporate experimentation.

WAPDA: Why is WAPDA the "Economic HQ" of Pakistan? Answer is simple. Water is our nation's main endowment and WAPDA was created in 1958 as the organization that would operate the existing barrages & dams and would also establish new infrastructure to feed the canal systems known as the Indus Basin Irrigation System (IBIS). One of the largest manmade irrigation system on this planet. No thanks to the Radcliffe Partition Award we lost control of the three Eastern (Punjab) rivers viz: Ravi, Sutlej & Beas. Therefore WAPDA had to improvise the so-called "Replacement Works" that would utilize a new set of "link canals" to bring the waters of the three Western rivers viz: Indus Main, Jhelum & Chenab to feed the critical irrigation waters to the command areas of Ravi, Sutlej & Beas. Their waters were available intermittently after 1948 and totally denied after the Indus Waters Treaty of 1960 (IWT 1960) as India was granted these three rivers. Also the IWT 1960 attempted to define the rights & obligations of the Indians on the three Western Rivers which flow through Indian Occupied Kashmir (IOK). After 60 years we observe classic symptoms; reduced water availability & seriously contaminated aquifers. We cannot imagine our economy to become self-sustaining without marshalling our water resources through WAPDA. Even our main industrial sector (textiles) is agro-based. WAPDA's role is existential for Pakistan.

I) The Hydrological Scenario after IWT 1960:

A) The disastrous fine-print of the Indus Waters Treaty: Within two months of partition the Imperial rulers midwifed the unfair accession of the State of Jammu & Kashmir to India in gross violation of the "partition formula". Hence the Western rivers: Indus-Main, Jhelum & Chenab also came under Indian control. The British imperial ruler had already ensured that the three Eastern tributaries of the Indus Basin (Rivers Ravi, Sutlej & Beas) are absolutely controlled by the upper riparian. Madhupur Headworks on the Ravi and Ferozepur Headworks on the Sutlej & Beas (combined flow) were delivered to India through the blatant "Radcliffe Award" that partitioned British India. A perfectly diabolical & cynical India agreed to send a water negotiating team in 1952 on the invitation of President Truman. The World Bank was tasked to be the 'facilitator' and the venue was Washington D.C. The next eight years saw negotiations & talks

between Indian and Pakistan delegates. The Indian side was led by Mr. N. D. Gulhati, a brilliant hydro-engineer while the Pak side was led by an eminent but non-technical bureaucrat Mr. G Mueenuddin. Whatever the draft of the Treaty conceded in the main text comprising of 12 Articles, was cleverly clouded & neutralized in 8 Annexures and complex Appendices to these Annexures. What the right-hand conceded the Indians took back via the left hand. Now to the letter & spirit of the IWT 1960. We face controversy over the phrase "the then" when "uninterrupted & non-consumptive use" by India of Western (Kashmir) waters was the spirit of the Treaty. World Bank gave Pakistan the ownership of the three Western rivers but not their possession. The preamble of the Treaty states "All" & "Unrestricted". Therefore Pakistan has the same rights on these three Western Rivers as India was granted over the three Eastern Rivers. However territorial reality did give a massive advantage to India. They got 100% waters of the three Eastern rivers depriving Pakistan till eternity of about 20% of its surface waters. India also got limited rights on the Western rivers "for the population of J&K". Later we observe a gross manipulation as India has built at least 28,000 MW hydropower infrastructure in IHK, where IOK needs 3,000 MW. Under which rationale Pakistan agreed to receive four East Punjab drains? Ground water is not a renewable resource unless a recharge balance is created. Once contaminated it is nearly impossible to correct it without a gigantic effort involving an injection of at least forty times its capacity with sweet water. WAPDA assumes an ever increasing role as a "strategic organization" truly being the Economic HQ.

B) WAPDA, Indian Water Aggression and its environmental fallout: Water and its strategic importance is still not appreciated by our nation in all its economic dimensions. The nation is flying blind with respect to its water endowment. Indian Water Aggression (IWA) & interference became even more pervasive after the Bangladesh war. New dams on the Indus are since 1974 blocked by Indian funded lobbies. Hydro politics with perverse logic & political gimmickry. Our population has tripled since 1970. An annual loss of +USD 60Bn and snowballing as we sink deeper in the imported energy trap. Over mining of aquifers & lack of waste water treatment has resulted in deadly contamination of Ground Water. An estimated 21mn citizens are in a Hepatitis epidemic. Resultantly cancers are increasing. By blocking our large surface reservoir projects India has committed "genocide" by stealth. Please note:

1) India had diabolically manipulated the treaty draft as we can clearly observe. **IWT in a nutshell:** No sweet water for West Punjab. Four drains of East Punjab to be received by Pakistan. Indian mischief started on day one. We have to still wake-up to this reality. The water sector is in crisis.
2) IWT 1960: completely ignores the environment & ecology. It ignores human need of drinking water. Yet we may not renegotiate it. The environmental issues it has created may be brought to the world's attention. India is waging a bacteriological war against the children of Pakistan. The 21 mn hepatitis patients are proof of their acts. The water scarcity is manipulated by the upper riparian.
3) John Briscoe: This South African scholar was the first to expose the Indian designs, when he was stationed in New Delhi as a World Bank expert. He resigned and became a professor at Harvard.
4) Today the Indian Indus Water Commission (IIWC) is a very powerful entity under an Indian Commissioner Indus Waters. A staff of about sixty (60) professionals are building upon the Gulhati approach which was to maximize Indian leverage as an Upper Riparian. At least + 25,000 members of the Intl. Commission for Irrigation & Drainage (ICID) New Delhi are at their disposal. ICID was established by Nehru in 1950 and is one of the world's largest organizations for R&D in hydrology. In contrast Pakistan Indus Waters Commission (PIWC) has a secretariat of just three (3) executives in Lahore under an acting Commissioner. Presently he is the Joint Secretary in the Federal Ministry of Water. In his best judgment the PIWC has just been shifted from Lahore to Islamabad for the Acting Commissioner's convenience. The IIWC is manned by top professionals. The PIWC by bureaucrats.

II) The push for imported energy has undermined WAPDA:

a) "Report of Prime Minister's Task Force on Energy" (January 1994) was presented by a group of 12 members including its Chairman Mr. Shahid Hassan Khan & Mr. Razzak Dawood, its Vice Chairman. Our bureaucracy was tutored on private power by a corporate team from UK since 1984/5. Two objectives:

1) To sell WAPDA by amending the WAPDA act. WAPDA could (it advises) retain reservoir operations.
2) The involvement of private sector investment in Thermal Power Projects by highlighting the impasse on the development of large multipurpose hydro projects like Kalabagh & Basha Dams and their associated irrigation, flood control & drainage works. Imported energy was declared critical.

Task Force advised the nation to ignore the long gestation hydro power development plans of WAPDA. Since local investors could not raise equity without GoP support, hence it was clear that foreign investment would dominate these "imported thermal energy projects". Stated objective was 2500 MW of IPP controlled TPS under the BOO/BOOT mode. That was also a calculated bluff. The report also declared "Pakistan has highest consumption of energy in South Asia". A bureaucratic trick to open the door to FDI control of the economy. Hence the first sixteen (16) IPPs took birth. The August 1992 HUBCO Agreement had received its legal cover. The first act of the 2nd PPP government (late 1993) had been to issue an amendment to the 1992 HUBCO Agreement. The Agreement was given a sweetener by making it "front-end loaded" to be able to retire its debt portion earlier. Our IPP policy is unsustainable & unrealistic. The policy of excessive imported energy & lack of reservoirs has unbalanced our economy.

b) The Islamabad Workshop of 08 & 09 Dec 1997: A watershed event titled "Next round of IPPs". The Federal Secy for Water & Power, Mr. Javed Burki, declared Thermal IPPs to be part of the "least cost solution". He said due to this IPP policy he expected WAPDA will cease to exist as a vertically integrated utility. He also announced that GoP cannot spare USD 35mn for hydel feasibilities. WAPDA could exist for dams, hydels, canals etc., which was its original role. An ignorant nation was punishing itself due to its hydro politics. He even praised the impractical May 1995 Hydel Private Power Policy. The PM's Directive of 24 Oct 1998 was inline with the task force recommendation "to restructure WAPDA with a view to corporatize by amending the WAPDA Act". The Directive was rescinded by intervention of think tanks.

c) Imported Energy Trap & its remedy: Pakistan is in an "imported energy trap" of around USD 30Bn annually. A rejuvenated WAPDA alone can reverse this situation. In 2018-19 Capacity payments (charges paid to IPPs for power capacity) were PKR 664Bn (+USD 5Bn) which rose 60% year over year. Paid in USD. It offset any decline in fuel cost component of the IPP tariff. Time has come for the nation to catch the "bull by the horn". Thermal IPPs on imported energy will have to be phased out. We also need to understand why gas quotas of public sector GENCOS were cancelled and transferred to other sectors during 2000-2010. The 1994 IPP policy allowed a tariff of US 6.5¢ with the HFO/RFO (Furnace oil) cost pegged at PKR 2,300/ton. By 2002 it was PKR +60,000/ton and any costs above the peg were pass-thru costs to the people of Pakistan. Furnace oil touched PKR 80,000/ton but no bureaucrat raised an alarm. Pakistan had once an ideal "Hydel : Thermal" ratio of 70 : 30 as envisaged by the pioneers of our power industry. Today let us replace Hydel with the term "Renewables". The "Renewables : Thermal Ratio" could be 80 : 20 as the world observes gigantic steps in the area of Renewable Energy; Solar PV, Wind Power, Hydroelectric & Biomass based generation. We had identified a +100,000 MW hydel potential. Conservatively the Solar PV & Wind Power potential is at least +100,000 MW of peak installed power. The Biomass based generation has a potential of 15,000. Germany achieved 34 GW (34,000 MW) Solar PV capacity by 2013 i.e. double of Pakistan's grid capacity in 2013. Germany crossed 55 GW Solar PV capacity

by 2018. They also have a massive Wind Energy generation. They have developed sophisticated forecasting & monitoring systems to ensure efficient integration with their grid. They will soon achieve their objective to close their Nuclear PPs. Private investment may only be considered if there is no imported energy involved. We have to punish those who issued the CCOE SRO of 05 Jan 2018 announcing that GoP will not purchase Renewable Energy. Hydropower will be the dominant sector within the RE. We need to eliminate ab-initio the 100% bureaucratic control of the Water, Energy & Power sectors.

d) Planning failures: No long term energy planning was found necessary. The nation kept on identifying sites for water storages, multipurpose hydro projects and so-called run-of-river hydel power projects. Implementation has been on adhoc basis. Gross negligence in the area of hydropower and water resources development was witnessed due to the lack of sequential plans for implementation. The "politics of water" took precedence over progress. A nation with a surface flow of around 100 MAF (+122 cubic km) of water annually from a height of 9,000 ft asl to around 1,000 ft asl within a horizontal distance of 550 miles should never have been classified as "poor". Pakistan is one of nine countries on the planet blessed with hydel potential that can sustainably provide +50 % of its energy needs in the 21st century. The Indus Cascade projects are critical. Pakistan is also located in an excellent Solar Insolation zone.

e) Expert opinion is supported by BR Research team: Power tariffs are all set to further increase as the second half on FY19 tariff adjustment is nearing. Sure enough, the base tariff went up in September 2019. The cumulative impact is anyone's guess right now, but it could well be in the range of Rs3-3.5 per unit. Pakistan's generation fuel mix is still heavily reliant on imported fuels. How alarming has the capacity payment rise been? What was Rs 280 billion in terms of capacity payments in FY16, has already become Rs816 billion – with further adjustment in lieu of FY19 to come. The recently made tariff adjustments on account of 1HFY19 arrived at a shortfall of Rs189 billion to be collected from the end users. Of that, Rs172 billion are on account of capacity payments. With rupee having lost significant value in 2HFY19, the upcoming 2HFY19 adjustment in August 2019, would most likely be higher than the one made for 1HFY19. The capacity payments for FY19 after adjustments could well cross Rs1000 billion – from Rs644 billion in FY18. Worse still, the demand has not increased anywhere close to the required rate, whereas additions have been made to capacity. More plants are in the pipeline next three years, and it is highly unlikely that the capacity payments would go down from here. A financial red alert be declared.

III) WAPDA had lost direction between 2007 & 2013:

Wasteful projects became the norm during the tenure of Chairman Mr. Shakil Durrani and the diabolical Member Water Mr. Raghib Abbas Shah. The planning section of WAPDA has become a virtual "graveyard" of long lost talent. When WAPDA will not build a large dam for +45 years where is the talent pool? A great national asset has been lost. Hard work is needed to create a team for large dams. The enemy has been able to infiltrate the Water Sector planning directly and surreptitiously via the ever influential "Indian Lobby" in the World Bank. The so-called Indus Cascade Reservoir projects are blocked. We are in deep sleep and content with over-exploiting our sole reservoir on the Indus Main forgetting that it is old & sick due to unchecked sedimentation entering its "delta" at an average of +160mn tons a year. Underwater dredging was never feasible. Due to the Ghazi Barrage a few km downstream the "sluicing" of this sediment is also no longer feasible. We could construct a sediment drain but where can we dump + 10,000 truck-loads of sand, silt & sediment every day? We can have World Bank funding for another useless project such as T-5 Ext HPP. Why not for Akhori Off-Channel storage on the Indus or KBD or DBD? What is critical? We focus on the ongoing consultancy imbroglio. NESPAK is not a large dam consultant. They always associated with recognized international lead consultants of dams. This adhoc policy will have a

major impact on WAPDA's reputation & solvency. WAPDA's new SOPs on major consultancy jobs are disturbing. NESPAK is being used as the "Trojan horse" for certain favorite consultants. The new culture to award consultancy & construction contracts on the basis of single bids is illegal & unprecedented.

Indus Cascade: The GB linkage with "Greater Kashmir" is a case of blatant treachery. The World Bank and other multilaterals refuse funding in any area declared part of "Greater Kashmir". I do not name those present & serving bureaucrats as well as a few pseudo politicians who maintained & promoted this illogical anti-Pakistan position. However the duo of Chairman Mr. Shakil Durrani & Member Water Mr. Raghib Abbas Shah never desired a detailed study of the Indus Cascade, Pakistan's lifeline. This duo brazenly tried to place the KBD project into disfavor and went to the extent of stating after the July 2010 floods that "if KBD had existed the flood damage would have been greater". We observe with great alarm that WAPDA has made no effort to improve perceptions on KBD or assist the Pakistan Indus Waters Commission (PIWC). WAPDA's HEP once provided the technical backbone to PIWC. This linkage be reinstated.

Tarbela T-4 Ext HPP: MMI/MMP after being awarded T-4 Ext HPP indulged in classical "fraudulent inducement" by projecting that annual energy of 3.84bn electrical units was possible. They had doubled the energy projection of 1.9bn units calculated by Chas T. Main in 1991 when Tarbela "Dead Level" was below 1340 ft asl. Power rating of generating plants is irrelevant if they cannot produce the electric energy due to lack of water. WAPDA has to factually analyze how much additional electric energy becomes available due to T-4 Ext HPP. The annual energy output of Tarbela will not increase by 3.84bn units (3,840 GWh) as per enhanced T-4 design of the MMI/MMP consortium. The total energy output of Tarbela is our concern. The T-4 Ext HPP output we reckon will not increase the output of Tarbela by 3.84bn units because of water shortage. A national calamity if WAPDA would insist that due to T-4 the energy output of Tarbela has increased by 3.84bn energy units per year. The nation must learn the truth.

Neelum Jhelum HPP: The Neelum Jhelum Power Tunnel project (NJHPP) due to the longer tunnel option selected by Mr. Raghib Abbas Shah not only was a great financial loss but deprived Muzaffarabad of Neelum waters. An environmental disaster for the AJK region. Perhaps a bigger source of attrition than upstream Kishenganga HEP (KGHEP) commissioned by India to divert waters from the Neelum to Bonar Nallah. Diversion of Neelum waters for NJHPP being much greater than by Indian KGHEP. If NJHPP was in a race with KGHEP as claimed by Mr. Shah then the longer tunnel option was "suicidal". However he managed a perfect excuse to induct Tunnel Boring Machines (TBMs) and inflated the NJHPP cost four times, making it the most expensive HPP in history. Cost of NJHPP energy is therefore very high.

Tarbela T-5 Extension HPP Vs Akhori Off-Channel Storage: Member Water Mr. Shah blocked the PC-II for Akhori Off-Channel storage around 2007 because he wanted to build T-4 Ext HPP. Inspite of insisting that the proposed T-5 Ext HPP is not a "good" project, WAPDA is pushing ahead with a project that is even less feasible than T-4. It will have no share of water after DBD & DASU HPP are built. It also involves a hazardous blasting at Tarbela Dam between main spillways. This project kills the nation's only hope of building "Akhori Off-Channel", the backup storage on the Indus. Tarbela is now an old & sick reservoir with sediment level at +1400 ft asl. If there is liquefaction of the sediment delta we could lose Tarbela Power generation. At least we can keep people of Pakistan alive with a backup storage on the Indus Main.

IV) The unfolding tragedy of recent WAPDA Consultancy bids:

AA) Mohmand Dam Consultancy WAPDA had ignored all three bidders who submitted bids in 2017. The Australian (SMEC) led consortium was the technically top ranked bidder with a bid of PKR 4.87bn on QCBS Basis (Quality + Cost Based System) but was ignored. WAPDA refloated the consultancy RFP with an unprecedented change to QBS (Quality Based System) and received a much higher bid from the Single Bidder; NESPAK consortium. They were awarded without a realistic cost comparison. QBS format ignores the cost factor. Within the NESPAK JV certain favorites were added.

BB) DBD: Two proposals were received for DBD Consultancy on 24 March 2018. Both bidders had been prequalified. Ignoring the tradition of WAPDA culture and International Consultancy norms, WAPDA re-invited the proposals but this time (similar Mohmand Dam Consultancy) on QBS basis instead of QCBS, the international format for such large projects. QBS format is only used for very small projects because it does not factor costs and that is also against PEPRA rules & common sense. Local companies were encouraged to take the lead. Sure enough similar to the Mohmand Dam story only one proposal i.e. NESPAK consortium. No other firm participated. To facilitate NESPAK and their selected partners MMI/MMP; WAPDA reduced the technical qualifications of key & professional personnel in the revised TOR. These are unprecedented & non-transparent acts by WAPDA. Again the NESPAK consortium was the sole bidder. Again MMP added to the NESPAK consortium. Again NESPAK was encouraged to more than double the estimated cost. It seems WAPDA wishes to award the consultancy to the NESPAK consortium at an exorbitant cost. No Member of NESPAK JV is a recognized Dam consultant. What was the imperative to compel NESPAK to induct MMP? Are we ignoring their transgressions on Tarbela T-4 Ext HPP? We are convinced that a single bid was encouraged to double the consultancy value. MMP again introduced as associate in the rebid similar Mohmand Dam. Why WAPDA has ”thrown all caution to the wind” by ignoring the two consultancy bids for DBD as received in March 2018? Is WAPDA simply trying to accommodate MMP as new members of the NESPAK consortium? The pattern established for Mohmand Dam Consultancy is again at play. It is also learnt that the TRACTEBEL (Lahmeyer) letter of June 2019 clearly informs WAPDA that organizations such as Transparency International share their concern. The affairs of WAPDA mega projects increased the Pakistan CPI (Corruption Perception Index) ranking. The water and power sectors are now the most visibly disturbed sectors that outsiders can observe. Smaller infrastructure projects of C&W or NHA can be concealed from outsiders but not the projects in the Water, Power & Energy sectors. The world is watching.

WAPDA is clearly inclined to award the DBD consultancy to local consultants under the leadership of NESPAK. A project as huge & technically complex as DBD, in the hands of a local consultant will be suicidal for the project & the nation. The narrative that local consultants will supplement their expertise by hiring expatriate individual consultants is fraught with serious issues of liability. It is also critical for a consultant on such a mega project that he should be capable of resisting pressure from all quarters who would be tempted to milk the project. At DBD both safety & economic future of Pakistan are at stake. NESPAK never designed a large dam; as lead consultant. Nation must refer to the great words of wisdom by Lt. Gen Dr. Ghulam Safdar Butt in his four letters of 2004 to Gen Pervez Musharraf & Chairman WAPDA.

Our main focus is the safety aspects outlined by Lt. Gen Dr. Butt (late) in his three letters to Gen. Musharraf and solitary letter to Chairman Mr. Tariq Hameed. All written by Dr. Butt in a period of less than six months during 2004. Consultants with negligible experience of Large Dams cannot review the safety of proposed DBD by renting out individual experts from around the world. That is a serious miscalculation.

NESPAK has not independently designed a RCC Dam of even 70 meters. How can they review a dam design with the world's highest RCC structure of nearly 270m in a zone of high seismic activity above the Central Asian fault-line? The river bed 3,000 ft asl. A high RCC dam in an extremely hazardous region of the Karakorums! He wanted the original design of a safer & lower CFRD (Concrete Faced Rock filled Dam.) Utilize local granite & eliminate river bed excavation. **This could reduce the cost and time to build DBD by half.** Where will NESPAK take the DBD costs? From USD 15 bn to USD 60 bn? Completion time 20 years? Due to lack of design expertise in hydropower, large dams & even large thermal plants. They can supervise construction if someone else will provide vital design expertise. Did NESPAK ever caution the WAPDA management or President Zardari's ministers that NJ HPP is the most expensive HPP in history on installed MW basis especially due to the longer tunnel option? Did they declare to the people of Pakistan that there is no race with the KHEP? Did they raise an alarm about the serious loss of energy output of NJ HPP after the PCA ratified the Indian position? DBD can be built as a safer structure (CFRD) below USD 7 bn.

A passage from **Lt. Gen. Dr. Butt's letter of June 30, 2004 to Chairman WAPDA Mr. Tariq Hameed:**

"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. Consider also a flexible rock filled dam with RCC cloaking. Do not allow the consultant to follow their hunch or first available solution. Every critical option and parameter must be considered in detail and only then discarded."…..(Chapter-15 of PBC Report)

Dr Butt was very disturbed on learning that DBD is being contemplated as an 8.1 MAF reservoir with 6.4 MAF live storage. He declared the height increase irresponsible. He was convinced its reservoir must not impound more than 5.7 MAF (live storage of 5 MAF) or less. A safer/lower DBD makes possible the upstream Raikot HPP (110 m, 1,800 MW.) A report on the DBD Seismic Hazard studies submitted to DBD/WAPDA management on Jan 20, 2017 states that during the period August 2014 through Dec 2016 a total of 732 seismic events were located within 250 km radial distance from DBD site. Magnitude of located events between 0.1 & 4.7 (depth ranged from 0.0 to 367 km.) Seismic events within 100 km radial distance are also plotted. DBD will act as a sediment check dam for all downstream hydro projects. A much more critical function compared to its flood control, storage & power gen capability.

V) Conclusion:

1) **Diamer Basha Dam:** Design Review & Construction Supervision consultancy must involve an internationally recognized large dam consultant in the lead. At least two compliant internationally famous consultant bids be evaluated. Failing which the economics & safety of DBD will be compromised. The consultants for DBD must have his international reputation at stake.
2) **WAPDA has to remain an autonomous organization with its own "Authority":** WAPDA is operating without its legal "Authority" for some three (3) years. An adhoc Member Water & Member Power means that WAPDA is operating outside the WAPDA Act. There is no imperative to violate the WAPDA Act. The CCI draft of 23 Dec 2019 is a manipulation of one individual in the Federal Water Ministry and must be reversed. The WAPDA Authority must follow the WAPDA Act and take decisions under its high mandate. Setting up of SECP registered entities outside the WAPDA system to make major financial decisions is not legal under the WAPDA Act. WAPDA's balance sheet is critical for growth.
3) **Invigorate WAPDA's design capability:** In 2018 several GMs & thirteen Chief Engineers were reportedly working on adhoc basis. Now WAPDA's solitary recognized hydroelectric expert is seeking early retirement. An admired Third World organization of the 1980s is now a shell. The nation must also know the truth on Tarbela Energy output due to T-4 Ext HPP.

4) **PIWC:** WAPDA's HEP once provided the technical backbone to PIWC. This is possible if top level engineers are groomed for the task. The 5th Commissioner PIWC Mr. Jamaat Ali Shah had severed this linkage. Recently the incumbent part time Commissioner PIWC Mr. Mehr Ali Shah, Jt. Secy. Federal Ministry of Water has maneuvered the illogical transfer of PIWC HQ to Islamabad from Lahore. This is absolutely irrational as the pool of engineers that could be motivated to assist PIWC are available in WAPDA and NESPAK; both based at Lahore.
5) **CIBSA:** Create the long awaited Commission for Indus Basin Strategic Analysis (CIBSA). Sketch is attached with the memo. Its R&D activities be given top priority & protected from enemy agents. Pakistan must sign with Afghanistan a joint declaration for development of Kabul River. It is in the long term interest of both countries. CIBSA, the proposed commission should be made responsible for both WAPDA & PIWC operational & technical affairs. The best talent in the country (military & civilian) be utilized. Involve top international firms from friendly countries. Understand that the enemy's strategy of blocking the large reservoirs of the Indus Cascade resulted in the imported energy trap. Pakistan has suffered already a + USD 400 bn loss due to the IPP Policy post 1994. Part of the trillion USD loss Pakistan has suffered by not building the Indus Cascade projects including KBD.
6) **The Renewables : Thermal ratio** as a national electric energy objective should be 80:20 and be achieved within 10 years. Renewables include Hydel, Solar PV, Wind Energy & Biomass. Hydro will be part of large multi-purpose reservoir projects. Therefore hydel will be predominant among the RE sector as irrigation is Pakistan's "achilles heel" and cannot be replaced.
7) **Settle the GB constitutional status asap:** GB was never Kashmir. Military occupation by the forces of The Raja of Kashmir do not make it part of "Greater Kashmir". The people of Baltistan are not ethnically or linguistically of Kashmiri origin. The brave people of GB rejected Kashmiri rule in 1947 and fought for their independence and merger with Pakistan. GB is an integral part of the Northern Areas of Pakistan and not part of "Greater Kashmir". They could negotiate their autonomy.
8) **WAPDA & the entire water sector is sinking** under a well thought-out "slow-burn" strike by the enemy & its agents. It is a simple non-kinetic struggle for our prime assets. The armed forces have to help defend this sector as well and join the civilian professionals in earnest.
9) **Do not extend the agreements of HUBCO & KAPCO**. Negotiate their send off. Understand that the enemy's strategy of blocking the large reservoirs of the Indus Cascade resulted in the imported energy trap. Pakistan has suffered already a + USD 400 bn loss due to the IPP Policy post 1994. It is part of the trillion USD loss Pakistan has suffered by not building the Indus Cascade projects including KBD.
10) **Within 2019 we witnessed the serious effects of the Capacity Trap**; excess electric power inspite of low hydel output in winter. All those connected with Thermal IPPs including Abdul Razzaq Dawood & Nadeem Babar should have no say in policy making on hydrology & energy matters.

P.S: Annexure AAA) lists major decisions of Mr. Raghib Abbas Shah as sanctioned by Mr. Shakil Durrani.

PAKISTAN PAINDABAD

Suleman Najib Khan
www.wrdc.com.pk (02 March 2020)

Ecnl: Annexure AAA)
CIBSA Sketch

Annexure AAA)

A nation that is callous about its main endowment: "water"

We have "irreversibly" over mined the aquifers in Punjab and consequently they face arsenic intrusion. Treatment & recycling of waste water is non-existent and in the process they are seriously contaminated. Sindh aquifers were already brackish since several centuries. No new reservoirs built after Tarbela on Indus was completed in 1974. We could thereafter not exploit our major hydropower potential from large multipurpose dams. Elements of the bureaucracy are exploiting these state of affairs. Three examples:

I. **Neelum Jhelum** (2008-2018) was planned as a +500 MW HPP based on the transfers of Neelum waters to Upper Jhelum. The cost around USD **0.9 bn**. Instead it was started in 2008 at 969 MW (peak power) and the Neelum waters are decided to be moved below the Upper Jhelum river to the combined Neelum-Jhelum. Obviously the hydraulic tunnel lengths are doubled to about 69 km (about a **third** are in twin tunnel configuration). As a result Muzaffarabad area of AJK is denied Neelum waters. The Indian Kishenganga HEP (KG HEP) also diverts the bulk of Neelum waters before entering AJK. The project is not only an environmental disaster for the people of AJK but a financial hit for the nation as its cost went beyond +USD 5.4 bn (before PKR devaluation.) The most expensive HPP in history on MWh basis. The WAPDA Member Water Mr. Raghib Abbas Shah **agreed to the change of contract basis** during the construction phase. The D&B (Drill and Blast) basis changed to TBM (Tunnel Boring Machines) for a part of the project as a result of which two TBM's were purchased in 2011 at a cost of about USD 250mn. The rationale was earlier completion but that was a bluff as the "Q4" squeezing soil conditions did not allow the TBMs to move faster. The result of these wicked interventions: the project finished a year behind schedule at a cost of +USD5.4bn and counting (instead of about USD 1.45bn in the contract.) The so-called race with India was already decimated in mid 1990's and the coup de grace was delivered by the PCA on 18 Feb 2013 allowing **India to divert waters for the KGHEP**.

II. **Tarbela 4th HPP Ext** (abbreviated T-4). Conceived in 1991 was advertised in 2009 as a 960 MW Peaking Power project on the 4th tunnel using two Francis Turbines 480 MW each. Project capable of 1.9 bn units. After Consultancy award in 2010, Mr. Raghib Abbas Shah (Member Water) agrees to the enhanced project output of 3.84bn units (3840 GWh). New configuration 3x470MW at Tunnel-4 to feed a double bifurcation for three (3) turbo sets. The selected consultant MMI (UK) in JV with CeB (Fr) lacked the necessary hydro-mechanical experience of large dams. Firstly the cost of T-4 project escalates about two times. Secondly the design based on twice the annual energy output is a "treacherous bluff". The sediment level of reservoir was 1310ft asl at the time of the Inception Report of Chas.T. Main & NESPAK (in 1991) but had risen to +1386ft asl at the time of project design in 2014. The energy output enhanced to 3.84bn units (i.e over twice the 1991 calculation of 1.9bn units) is fiction because besides sedimentation constraints there is a water availability constraint as well. The disastrous attempt to commission unit # 17 on 02 March 2018 is proof that the consultant & WAPDA managers were "stupid" to the extreme. The sedimentation scenario was clearly not a factor for the T-4 consultants. The project enhanced due to criminal collusion between the project consultant and Mr. Raghib Abbas Shah, who also acted as WAPDA Chairman (Sep 2012-April 2014). Annual energy output due to T-4 must be determined.

III. **Tarbela 5th HPP Ext (T-5):** There is no logic to build T-5 HPP extension of Tarbela **without a Feasibility Study**. Water for T-5 is simply not available. After DASU HPP & Diamer Basha Dam even water for T-4 will not be available except during flood season. T-5 also requires high level intakes. This would involve blasting between the two Tarbela spillways; an extremely hazardous & risky undertaking. The nation's crying need on the Indus Main is for a backup storage incase Tarbela reservoir is lost or becomes unusable. Akhori off-channel storage is perfectly suitable but remains blocked since 2006 for mysterious reasons. Apparently the same anti Kalabagh Dam lobby.

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