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WATER CRISIS IN PAKISTAN AND SOLUTIONS

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by
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Symposium on
Water Crisis in Pakistan and its Solutions
December 2003
Keynote Address
by
Engr. Rana Khursheed Anver*

Pakistan, a wonderful land of scenic contrasts with over 140 million people has an agriculture-oriented economy. Better part of our agriculture is based on canal irrigation.

Most of the agriculture lands are located in arid and semi arid regions traversed by River Indus and its tributaries with tremendous seasonal fluctuations in their discharges. Age-old irrigation pattern based on run of the river systems and antiquated agricultural practices are highly inefficient and no longer tenable, especially in the wake of our burgeoning population and needs of ever-increasing mouths. Having one of the highest population rates, the demands are fast outstripping the growth potential.

Furthermore, hydrologic phenomena El-Nino and La-Nina cause cyclic variations in precipitation and runoff. One causes high precipitation and serious flood, while other results in scanty and sometimes zero precipitation causing serious drought years. It not only means reduction in agricultural produce, but also harbingers acute problems of water scarcity even for domestic and drinking purposes. Pakistan has just passed through such a phase during past few years further accentuating the crisis.

It may painfully be added that the criminal delay in taking up new large/mega dams not only for replacement of the lost storage, but to develop new resources, would never be forgiven by our posterity. It is a self-inflicted crisis. No nation can endure such lapses for a long spell of time.

Pakistan Engineering Congress, taking a special note of this vital issue, decided to allocate one full day for discussion in a symposium during the annual session.

Calls for papers were issued to members to which there was a healthy response. Because of short time available, only 10 papers were accepted for presentation and discussion in the symposium. Now I would give a quick run down of each paper with recommendations.

1. The paper on **"GROUND WATER RESOURCES OF PAKISTAN AND ITS MANAGEMENT"** by Engr. Muhammad Farooq Khan Niazi and Engr. Abdul Hafeez proposes to use improved integrated management of groundwater resources for mitigation of water crisis in Pakistan. It contains important information and recommends: -

    - Ground water, the third important water resource if utilized properly can help reduce the water problems in Pakistan.

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- The Ground water management should be improved. There should be checks and balances on inordinate/unplanned over pumping of groundwater to prevent its misuse and over mining. The authors have given some useful suggestions in this regard.

- In good quality shallow water zones, only centrifugal pumps should be allowed instead of turbines for pumping so that deep saline water is not disturbed.

- Government agencies working in the villages of shallow water zones must advise the farmers about restricted pumping so that the limited fresh ground water is not exhausted.

2. The paper on **"ROLE OF BARANI AREAS IN MITIGATION OF WATER CRISIS IN PAKISTAN"** by Muhammad Iqbal Lone and Fayyaz-Ul-Hassan advocates that increase in population and changes in climate have been causing water crisis in Pakistan. According to them there is a need to create awareness among the water users and persuade them to use the modern improved watering practices like rainwater harvesting, water conservation and new irrigation techniques such as drip and sprinkler irrigation. This paper discusses site-specific measures for optimizing the existing quantum of water for irrigated and Barani areas in the country.

3. The paper on **"WATER RESOURCES MANAGEMENT-DROUGHT MITIGATION STRATEGY"** by Engr. Mian Hafiz Ullah, Ex. Chairman and sitting member IRSA, analyzes the droughts and their effects with focus on river flows during wet and dry years. According to his assessment, the minimum additional storage required to mitigate a 5 years drought works out to 127 MAF. This storage can be made available at many locations in the mountains through which the rivers flow. He says that all storage dams should be carry over type except for Kalabagh which should have an outlet on the right side, to enable NWFP make proper use of its water accord share. Also question of royalty should be rationalized and settled once for all. After having settled these parameters, we should go on building storages instead of having site specific comments from provinces. These carry-over dams could repay their cost in a maximum of 5 years.

4. Dr. MAQ Jahangir Durrani, in his paper on **"REUSE OF WASTE WATER FOR SUSTAINABLE MANAGEMENT OF WATER RESOURCES"** presents his study details and recommends the reuse of waste water for irrigation, industry and recreational purposes. He suggests that the integration of sewage use into national water resources and agricultural planning is essential. The use of sewage has been practiced in many parts of world for centuries, especially for agriculture, some times even without any consideration of adequate **environment and health safe guards.**

5. The paper entitled **"WATER CRISIS IN PAKISTAN AND SOLUTIONS"** by Engr. Fateh Ullah Khan, Former Chairman IRSA analyses the increasing scarcity of irrigation water, its causes and effects and the measures for improvement. He recommends avoidance of wastage, better irrigation and drainage practices and mitigation of loss of storage capacity of existing reservoirs. He suggests that the ultimate solution lies in integrated comprehensive water management and addition of storages. He recommends a large storage at Katzarah near Skardu and supporting

small storages. At the end the author mentions that removal of mismanagement and addition of storages can easily solve the water crisis in drought periods.

6. Engr. Saeed Akhtar Niazi in his paper on **"ANATOMY OF HIGH POWER TARIFF"** analyses the relationship of low river discharge in dry years, its effect on hydel generation, ingress of thermal power generation and cost structure. The author suggests that multi purpose storages like Kalabagh have to be created at the earliest to provide enough storage to meet drought needs and higher power generation to meet the ever - increasing requirement of power.

7. The paper on **"MITIGATING WATER SHORTAGE BY MAKING TARBELA A SUSTAINABLE RESERVOIR"** by Engr. Amjad Agha and Engr. Akram Khan analyses the contents of a report suggesting to attempt sediment sluicing to check the sedimentation process and reduction in the capacity of Tarbela Reservoir. The authors at the end have suggested careful consideration in determining the limit to which the minimum operating levels of Tarbela reservoir can be raised considering the storage releases for irrigation and power needs and all other issues like possible liquefaction or sloughing of delta.

8. Mr. M. Azhar Javed, M. Tariq Yamin, Ch. Karamat Ali, and Engr. Rashid Minhas in their paper on **"DEMOGRAPHIC INFLUENCES ON LAND AND WATER RESOURCES AND FOOD SUSTAINABILITY CONCERNS: VISION 2025"** have picked up an area which has not been probed up till now i.e. demographic influences on land and water resources and sustainability. The paper contains a wealth of data, which have been analyzed with view of irrigation engineers. According to the authors an integrated approach and long - term policies for balancing the population and agriculture growth rates along with control and organization of fertile lands will have positive influences on solutions to droughts and water crisis.

9. The paper on **"A TRANSPARENT PLAN FOR MEETING WATER SHORTAGE IN PAKISTAN"** by Engr. Mohiuddun Khan brings out the water shortage in and outside irrigation system. Indicating the increase in population and consequent water requirements, the author proposes some measures, especially new water storage structures and modifications of old ones like Chashma Barrage. His proposal also provides a limited scope of inland navigation. He also discusses the pros and cons of some interventions presently under study and concludes that his proposal if implemented can make the deserts bloom and convert the available barren lands into productive tracts solving the irrigated agriculture problems and address the crisis created by water shortage.

10. The paper titled **"DEVELOPMENT OF SURFACE WATER RESOURCES"** by Engr Dr. Izhar ul Haq and Engr. M Mushtaq Chaudhary presents a compact overview of the surface water resources available in Pakistan. The sedimentation of existing reservoirs has been given special treatment. Water conservation and demand have also been given reasonable attention. WAPDA's vision 2025 and water availability have also been discussed. The future storage projects have been discussed in reasonable detail.

    The paper concludes that a minimum of 25 MAF is available for storage which if not utilized. is likely to cause serious water, food and power shortage by 2010. It

recommends construction of at-least two storage dams with allied power in this decade.

In the end I would say a few words about Kalabagh dam-a project of vital importance which was caught in a crossfire of political wrangling, now appears to have been reduced to smoldering ashes. Notwithstanding its overwhelming merit, Kalabagh dam is being sacrificed at the alter of political expediency. If Kalabagh is to remain politically intractable for an indefinite time why should we not go in for the least controversial sites with much higher potential in upper reaches right away? Why should all other alternates and opportunities go unprobed/unexplored. We must be awake to recognize bounties of nature bestowed upon us which still await exploitation. Up in our northern areas, we have some excellent sties for mega dams of 25-30 MAF storage and around 30.000 MW cheap hydel power potential. Such mega dams would absorb all major shocks of dry and wet spells, harness wasteful escapages to the sea and supply irrigation water on a preplanned and assured basis. It would also lower down the sky-high power tariff to an acceptable level. Having such vast resources up our sleeves, why should the majority of 140 million people be destined to subsist at or below poverty level? Why should they be deprived of two square meals a day? Why should they shamelessly look up to the developed nations to be bailed out of one crisis after another? Vigilant nations have exploited such resources to the hilt to boost up their economies where not a single drop of water is wasted/escaped to sea as in the case of Colorado River in USA.

This river is a true example of political conditions similar to ours. Seven States of USA depend on its waters for their Irrigation, industrial and domestic needs which even today exceed the available supplies. The total inflow of Colorado River ranges between 13-15 MAF. It is mainly a snow-fed river.

For ensuring equitable distribution of water, proper regulation and higher hydel generation, dams with a capacity of over 60 MAF (more than four times the total inflow of the river) have been constructed and are in service, ensuring complete protection against floods and meeting the requirements of all the riparians in an equitable manner.

No doubt, not a single drop of precious water escapes to sea in a country so advanced, so developed and so conscious of environment, ecology, forests and aquaculture. There are a number of such illustrations.

This is how they reach the destination of Power and Plenty. A fateful destiny awaits us if we do not take up cudgels on war footings.

During the symposium proceedings, some very interesting results are likely to emerge. Based on Panel discussions, recommendations would be formulated and submitted to the government for consideration.