



Pakistan Engineering Congress

A Report on the
World Water Day 2011 – Held On 16th April, 2011 on the Topic of
“Water for Cities – Urban Challenges”

In view of the position that the Congress was engaged in holding the International Conference on Floods in Pakistan – 2010, in keeping with the decision at 61st IEC Meeting and the 6th Asian Regional Conference of International Commission on Irrigation and Drainage, Yogyakarta - Indonesia, 10 - 16, October 2010, the World Water Day could not be held on March 22, 2011. It was instead held at the auditorium of the Congress on 16th April 2011. The proceedings started with the recitation from Holy Quran. Inaugural address was presented by Engr. Husnain Ahmad President Pakistan Engineering Congress / Vice-President ICID. In all 10 papers were presented by eminent Water Resources experts / Environmentalists as detailed below:-

- **Drinking Water Quality Challenges in Pakistan**
By: Mr. Z.A.Soomro, Mr. M.I.A. Khokhar, Mr. W. Hussain and Mr.M. Hussain
- **Assessing Microbiological Safety of Drinking Water: a case study of Islamabad, Pakistan**
By: Dr. Imran Hashmi, Ms. Sara Qaiser, Ms. Syeda Asma, Mr. M. Talal Ali Khan and Ms. Sidra Abbas
- **Water for Cities: the Challenges and Solutions**
By: Prof. Dr. S.E. Benjamin
- **Algae Based Sewage Treatment and Its Re-use for Irrigation and Landscaping**
By: Ms. Madiha Zakria, Dr. Abdullah Yasar, Ms. Saba Sadiq
- **Challenges and Opportunities in Urban Water Supply in Punjab Province**
By Mr. Salman Yusuf
- **Community Participation in Development, Operation & Maintenance of Water Supply and Sewerage Services**
By: Dr. Javed Iqbal, Mr. Abdul Qadeer Khan
- **Transboundary Pollution Problems and Water Vulnerability Across International Borders**
By: Ms. Tayyaba Alam, Dr. Abdullah Yasar
- **Sustainable Management of Textile Waste Water of Pakistan**
By: Dr. Muhammad Khalid Iqbal, Mr. Sameer Ahmed, Dr. Shahzad Alam,

Dr. Tahira Shafiq

- **Water Supply Problems in Rawalpindi City**

By: Ch. Naseer Ahmad, Mr. Azizullah Khan, Mr. Ghalib Hasnain, Mr. Shahid Durez

- **Groundwater Extraction And Waste Water Disposal Regulation-Is Lahore Aquifer At Stake With As Usual Approach?**

By: Muhammad Basharat, Sultan Ahmad Rizvi

Upon the conclusion of the seminar, Shields / Certificates were presented to the Speakers. Afterwards, a panel discussion was held to formulate recommendations for improving quantitative / qualitative supply of water to the citizens.

These are given below:-

1. It is projected that water availability will be less than 700 cubic meters per capita by 2025. Due to water shortage and contamination of the remaining water resources, only 25.61% of the total population of Pakistan has access to safe drinking water. The water shortage in the agriculture sector is another serious issue. The water shortage for agriculture sector was about 29% for the year 2010 and will be 33% for 2025. At present, irrigation uses about 93% of the water currently utilized in Pakistan. The rest is used for supplies to urban and rural populations and industry. The treatment and reuse of sewage and industrial effluents in Pakistan is currently a low priority. This has led us towards this catastrophic situation. An estimated 975.771 million gallons of water goes waste annually in Pakistan and 9000 million gallons of waste water having 20,000 tons of BOD loading rate are discharged into water bodies. Proper treatment and reuse of this water for irrigation and landscaping can help to solve the problem. Algae based waste water treatment is an economical and efficient way of treating waste water coming from different drains of Lahore under WASA. It can remove upto 90% of the contaminants from the waste water within few days. In Lahore, PHA is responsible for the irrigation of different parks, green belts and golf courses. The landscaping of Lahore can be done with the treated waste water to save the precious fresh water resources. Moreover, this treated waste water can be used for the irrigation of agricultural land, which is currently facing water shortage problem. This would be economical and also ensure constant supply of water. The nutrients present in waste water can boost-up the crop yield and this

in turn, can save the cost that the farmers have to pay in terms of fertilizers. At this time, treatment and reuse of waste water should be the top most priority of the Government to bring change in the current circumstances. The 7,200 kanals of land allocated to WASA for waste water treatment is still not being used for any purpose. Government should take this practice into consideration to cope up with the current water shortfall. Strong law enforcement and compliance is necessary for the protection of freshwater resources.

2. Majority of the samples collected and analyzed by Pakistan Council of Research in Water Resources (PCRWR) were found to be unfit for drinking purposes in all four provinces without any exception.
 - Microbiological contamination was found in more than half of the water samples of 21 cities.
 - Arsenic found to be very high in the water samples collected from all major cities of Punjab, mainly due to release of toxic materials / effluents and its percolation in ground water.
 - Iron concentration was found to be very high in districts of Mardan and Peshawar.
 - High turbidity values were obtained in samples of Hyderabad and Sukkur.

Hence, Water supply agencies all over the country must ensure that the water being supplied to the user is free of bacterial contamination. Moreover, no water supply scheme should be approved unless detailed investigations of the quality, quantity and sustainability have been carried-out. Also, alternate source of water should be identified in areas where the quality of existing source of water supply is contaminated.

3. A Survey by IWASRI (WAPDA) on Un-checked use of Ground Water states:-

Maintaining the water balance of withdrawals and recharge is vital for managing human impact on groundwater resources. There is little evidence that the government agencies particularly the WASA of Lahore Development Authority have re-engineered their capacity and funding to deal with this great challenge. Furthermore, there is no mechanism for allocating groundwater nor regulating its use. Any landowner can install a tubewell and begin pumping groundwater to the extent of his satisfaction. It is urgent that groundwater management, ensuring utilization of safe yield and quality protection, be done through intensive monitoring and enforcement of regulated control over the Lahore aquifers.

It can be achieved by adopting following steps by making the community to treat water as an economic good and achieving control of groundwater abstraction and waste disposal;

- Each and every use of existing groundwater above 0.20 cusecs should be registered with all the allied information regarding its borehole and quantum of pumping.
 - Each new user should be required to get a permit before installation of pumping equipment.
 - Building bye-laws should be amended and enforced for private as well as public buildings for achieving maximum possible rainwater harvesting and recharge to groundwater.
 - Monitoring of waste disposal at key points should be done to act as guiding tool for finding point sources of major pollution in the surface drains.
 - Every user of groundwater should be charged with certain amount of groundwater development and management surcharge. The amount so collected should be reserved and used for future development projects in the Lahore city for improved management of the resources, so that sustainability can be assured for generations to come.
4. Keeping in view the financial constraints of the country, the community participation in the development, operation and maintenance may be encouraged. The successful examples of community participation projects like Changa Pani Programme and Orangi Pilot Project may be followed.
- Water Utilities should focus on the provision of external infrastructure including main lines, tubewells, overhead reservoirs, trunk sewers, disposal stations and treatment plants while the citizens should develop **internal** infrastructure like small distribution lines, water and sewer house connections, septic tank and lateral sewers (street sewers) on low cost & self help model basis.
 - Maintenance of the services can be transferred to the citizens by formulating citizen organizations. These organizations will reduce the regular cost of the WASA being spent on maintenance. (In case of Changa Pani Programme The WASCO or Water and Sanitation Committee is a very good example, which is operating the internal component of water supply and sewerage system of the area.
5. In Lahore, WASA (Water and Sanitation Agency) is responsible for covering 66% of the Lahore's area to which it provides water and sanitation facilities. There are 15- sewerage drains under WASA which are collecting sewage water from different localities of Lahore and adjacent cities and dispose it off in river

Ravi through various pumping stations (WASA, 2005). These 15 drains are: Lakhudair Drain (Mehmood Booti Drain), Sukh Nehr, Shadbagh Drain, Ravi Road Drain, Shahdara Village Drain, Farukhsbad Drain, Buddha Ravi Drain, Outfall Drain, Gulshan-e-Ravi Disposal Station, Babu Sabu/Shadman Drain, Hudiara Drain, Jaranwala Drain, Summundri Drain and Gojra Drain. Other than the 15 drains, five irrigation channels and canals, namely Marala Ravi Link Canal, Upper Chenab Canal, Qadirabad Link Canal, Trimu- Sidnai Link Canal and Havily Main Line Canal, are also throwing industrial and municipal waste water into the Ravi. To increase the water availability about 2000 cusecs of fresh water from Marala Ravi (MR) LINK canal could be released into the river without impacting the water level at Baloki head works. This will maintain dissolved oxygen level of 4 to 5mg/l which is required for the aquaculture survival. A lake/reservoir can be constructed within the course of the river from Siphon to Thokar Niaz Baig which will have many positive outcomes, flood control, recharging of ground water, development of recreational sites, aquaculture propagation and land reclamation.

According to a study carried out by Environmental Protection Department (EPD), Punjab, collectively these drains are discharging about 1,307.08 tonnes hazardous and toxic waste into river Ravi. The load from Lahore is 728.75 tonnes per day which is contributing 56% of the Ravi pollution. It is estimated that, in Pakistan, only 1% of the industrial (MOE-PAK, 2005a) and 8% of urban waste water is treated before entering into the different water bodies (WB-CWRAS, 2005).

6. Water resources of Pakistan are experiencing transboundary water pollution. Streams and rivers of Central Punjab like Ravi, Sutlej, Chenab, Hudiara , Deg, Aik or Basanta are carrying pollution from India. Among these, Hudiara is the most polluted one, which is carrying untreated sewage and industrial pollution to Pakistan from Atari Border. According to the Article-IV of Indus Water Treaty (1960), none of the country can pollute the water resources of the other and if it does so, then the polluter will pay for that pollution. Despite of the signed treaty, as a result of this, water resources of Pakistan are getting more and more

polluted day by day and it has wide range impact on environment like water quality deterioration, habitat loss and human health problems. So, government should take-up this violation of Indus water treaty on Pak India bilateral and international forums.

7. For ensuring water-supply to urban areas 100% metering is un-avoidable, to boost the revenues and provide funding for capital works 300, 000 lac meters need to be installed in Punjab alone. It should at least be accomplished in towns, cities and big cities.
8. Construction of Mega –Dams on Fast Track.
9. Installation of Household Water Treatment (HWT'S) appliances.
10. The establishment of the National Pollutant Discharge Elimination System (NPDES) permitting program, which requires any organization that discharges pollutants into surface water to obtain a permit.