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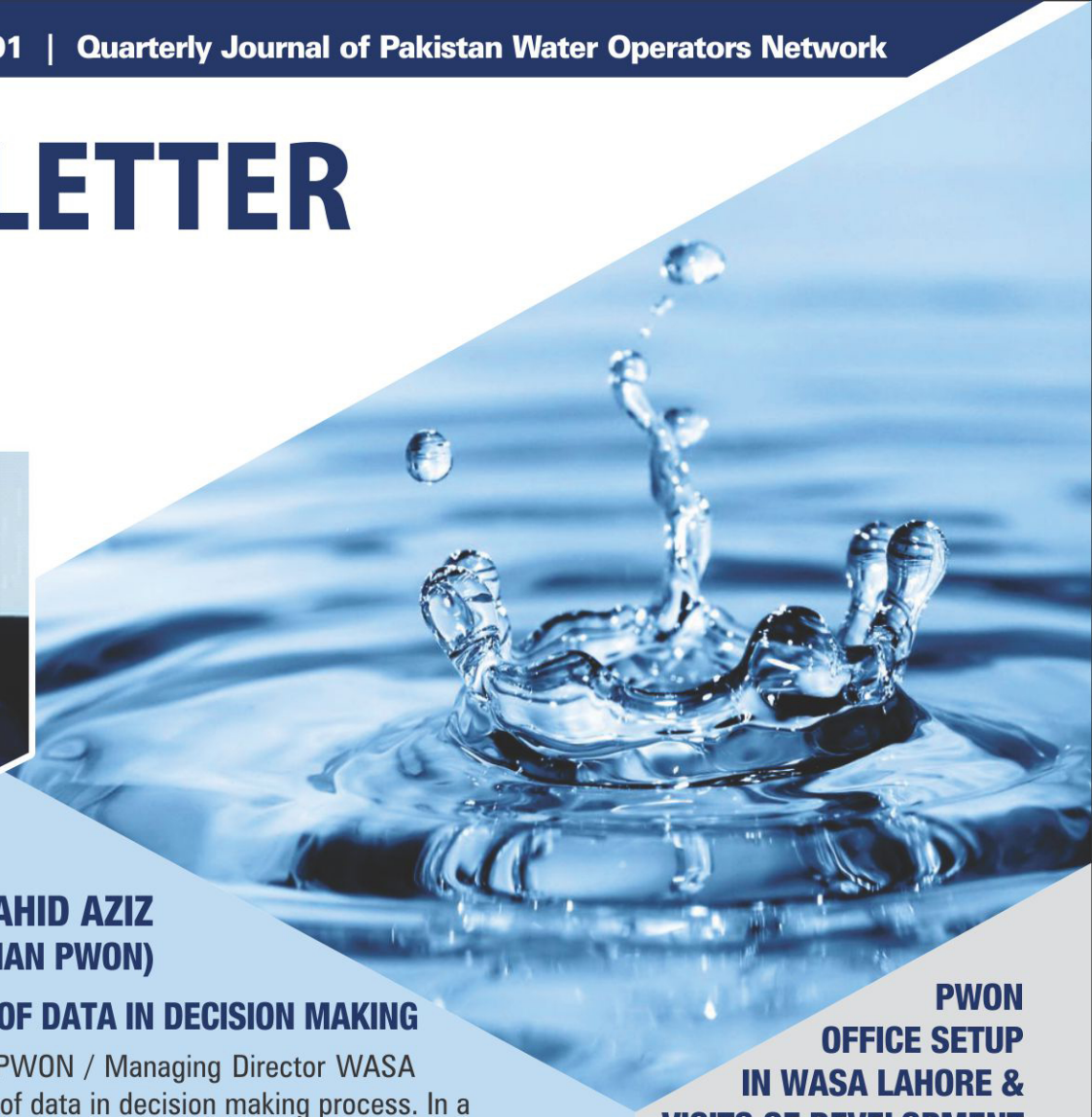
NEWSLETTER

PWON
Pakistan Water Operators Network



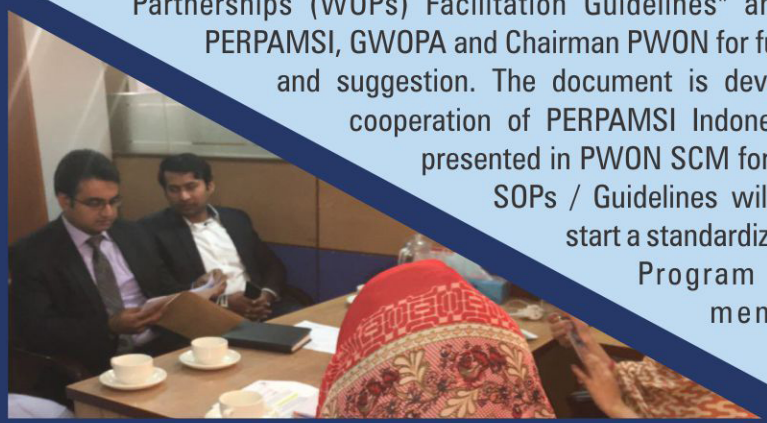
SYED ZAHID AZIZ (CHAIRMAN PWON)

ACCENTUATES ON USE OF DATA IN DECISION MAKING

Syed Zahid Aziz Chairman PWON / Managing Director WASA Lahore accentuated on use of data in decision making process. In a massage for all member utilities he said, PWON has issued WASA Lahore Key performance indicators report of year 2016, which is a very progressive step. To determine the performance of Water & Sanitation Utilities, there are set key performance indicators (KPIs) and these can provide an in depth analysis of utility performance for a certain time period. If all utilities keeps providing data then PWON will continue to issue reports of all member utilities. Currently being Chairman I offered my Utility i.e WASA Lahore data to encourage other utilities to follow the steps. I hope all member utilities will make it a practice in coming years.

PWON DEVELOPED NATIONAL WOPS FACILITATION GUIDELINES

On 13th July, 2017 PWON developed "PWON National Water Operator Partnerships (WOPs) Facilitation Guidelines" and submit it to PERPAMSI, GWOPA and Chairman PWON for further comments and suggestion. The document is developed with the cooperation of PERPAMSI Indonesia and will be presented in PWON SCM for approval. These SOPs / Guidelines will help PWON to start a standardize National WOPs Program within PWON member water & sanitation utilities.



PWON OFFICE SETUP IN WASA LAHORE & VISITS OF DEVELOPMENT PARTNERS

On 6th July , 2017 PWON setup its office in WASA Lahore as per directions of Syed Zahid Aziz - Chairman PWON / MD WASA Lahore. On 7th, 19th and 24th July Mr. Touqeer Abbasi & Mr. Farakat Ali (From Water Aid) , Ms. Juwaira Sultan (Danish Embassy), and Mr. Ahsan Paracha (From AFD) respectively, visited PWON Secretariat - WASA Lahore, and discussed PWON activities with National Coordinator.

IB-NET & PWON COMMUNICATION ON CREATION OF EXCLUSIVE LINK FOR PAKISTAN W&S UTILITIES ON ITS WEBSITE

On 23rd August, 2017 through an online communication between Mr. Alexander, World Bank Washington and National Coordinator PWON, IB-Net appreciated the PWON report of WASA Lahore KPIs and showed agreement to create an exclusive link for Pakistan W&S Utilities on www.ib-net.org. IB-Net is also interested to show Pakistan utilities' tariff data on http://tariffs.ib-net.org. PWON ensured support for data provision of Pakistani W&S Utilities.

PWON AND ACWUA COLLABORATION FOR CAPACITY BUILDING & KNOWLEDGE SHARING

On 29th August, 2017 Ms. Maqsooda Fatima National Coordinator PWON had an online meeting with Mr. Khaldon Khashman - Secretary General - Arab Countries Water Utilities Association along with Mr. Masroor Ahmed - W&S Expert. Discussion focused on common areas of interest between ACWUA and PWON. PWON is looking forward a constructive collaboration with ACWUA that will be beneficial for W&S Utilities in Pakistan.

As a start of this collaboration ACWUA has shared their knowledge resources with PWON, in near future MoU will be signed between ACWUA and PWON.

PWON ISSUED KPIS REPORT OF WASA LAHORE FOR YEAR 2016

On 8th August PWON issued "PWON KEY PERFORMANCE IDICATORS REPORT OF WASA LAHORE - YEAR 2016". Detailed report is available on www.pwon.pk. Summary of report is included in this edition.

WASA LAHORE SIGNED MOU WITH MASZ CREC CHINA

Syed Zahid Aziz – Managing Director WASA Lahore along with other dignitaries at the signing ceremony of MOU with MASZ CREC CONSORTIUM China for development of Surface Water / Waste Water Treatment Plants for the city of Lahore with an estimated investment of 1.5 billion USD. Project Includes Lahore Surface Induction for ~ 100 cusecs from BRB Canal, Construction of Shadbagh and Mehmood Booti WWTP of 220 cusec, Construction of Shahdara WWTP of 125 cusec, Construction of Babu Sabu WWTP of 475 cusec, and Burki integrated drinking and Waste Water Treatment Pilot Project.

Water and Sanitation Agency (WASA) Lahore

Key Performance Indicators Report (Y-2016)

Sr. No.	Performance Indicators	Unit	1st Q	2nd Q	3rd Q	4th Q	Yearly Avg	Remarks
1. Services Coverage								
1.1	Water Coverage	%	89.35	90.39	91.96	92.08	90.94	
1.2	Sewerage Coverage	%	90.11	90.49	91.10	90.93	90.66	
2. Production and Consumption								
2.1	Water production	lpcd	313.33	313.37	318.74	317.31	315.69	
2.2	Water Consumption	lpcd	200.16	200.41	192.39	189.40	195.59	
3. Non Revenue Water								
3.1	Non-Revenue Water	%	39.29	39.30	43.37	44.00	41.49	
3.2	Un-Accounted for Water	%	36.12	36.05	39.64	40.31	38.03	
4. Metering Practices								
4.1	Metering Level	%	5.34	5.05	4.75	4.63	4.94	
4.2	Metered Water Sold	%	6.92	6.99	6.92	6.92	6.94	
5. Network Performance								
5.1	Pipe Breaks / Burst	Breaks per km	0.07	0.09	0.09	0.09	0.08	
5.2	Sewerage System Blockages	Blockage per km	8.71	7.81	9.36	5.87	7.94	
5.3	Replacement of Manhole Covers	%	1.23	1.23	1.23	1.24	1.23	
5.4	Pipe Leakages	Leakages per km	1.89	1.72	1.36	1.70	1.67	
5.5	Cleaning / Desilting of Manholes	%	14.91	14.76	14.98	14.94	14.90	
5.6	Cleaning / Desiltation of Sewers	%	13.46	13.27	12.88	11.69	12.82	
5.7	Storm Water Drain Used as Sludge carriers.	%	100.00	100.00	100.00	100.00	100.00	
5.8	Sewer collapse / Crown Failure	%	0.60	0.66	0.56	0.47	0.57	
6. Cost and Staffing								
6.1	Unit Operational Cost - Water Sold	Rs. Per cubic meter of water sold	16.07	16.65	15.17	15.44	15.83	
6.2	Unit Operational Cost - Water Produced	Rs. Per cubic meter of water produced	9.75	10.10	8.59	8.65	9.27	
6.3	W&WW Staff/1000 W &WW Connections	ratio	6.71	6.68	6.63	6.58	6.65	
6.4	W Staff /1000 Water Connections	ratio	5.62	5.59	5.54	5.53	5.57	
6.5	WW Staff/ 1000 WW Connections	ratio	7.83	7.80	7.74	7.64	7.75	

6.6	Salary Costs as a proportion of Total Operating Cost	%	38.61	39.12	41.01	43.59	40.58	
6.7	Power/Electricity Costs as a proportion of Total Operating Cost	%	45.54	43.89	47.13	44.20	45.19	
6.8	Maintenance Costs as a proportion of Total Operating Costs(non contracted)	%	0.00	0.00	0.00	0.00	0.00	
6.9	Contracted-out Costs as a proportion of Operating Cost	%	12.63	14.07	7.13	8.44	10.57	
7. Water Quality								
7.1	Chemically Unfit Water Samples at Source	%	0.00	0.00	0.31	0.30	0.15	
7.2	Biologically Unfit Water Samples at Source	%	0.00	0.00	0.00	0.00	0.00	
7.3	Chemically Unfit Water Samples at Tap	%	0.71	0.85	1.67	2.14	1.34	
7.4	Biologically Unfit Water Samples at Tap	%	1.86	1.77	6.17	5.71	3.88	
7.5	Water Quality – Required Residual Chlorine Test	%	51.80	51.80	31.47	31.33	41.60	
7.6	Water Quality – Samples Passed Residual chlorine Test	%	100.00	100.00	100.00	100.00	100.00	
8. Quality of Services								
8.1	Water Supply Complaints	%	0.71	0.35	0.36	0.39	0.45	
8.2	Waste Water Complaints	%	5.53	2.76	2.32	1.99	3.15	
8.3	Revenue / Billing Complaints	%	0.01	0.01	0.01	0.01	0.01	
8.4	Wastewater Treatment-Primary	%	0.00	0.00	0.00	0.00	0.00	
8.5	Wastewater treatment-secondary	%	0.00	0.00	0.00	0.00	0.00	
9. Billings and Collections								
9.1	Average Revenue of Water & Waste Water	Rs. per cubic meter of water sold	7.19	7.27	6.85	6.10	6.85	
9.2	Collection Period	Days	474.57	469.50	627.01	630.64	550.43	
9.3	Billing Efficiency	%	91.61	91.37	91.05	91.19	91.30	
9.4	Collection Efficiency (Physical)	%	64.00	64.00	64.00	64.00	64.00	
9.5	Collection Efficiency (Financial)	%	81.00	81.00	81.00	81.00	81.00	
10. Financial Performance								
10.1	Operational cost coverage	ratio	0.45	0.44	0.45	0.40	0.43	
10.2	Working Ratio	ratio	2.24	2.29	2.21	2.53	2.32	
10.3	Debt service ratio	%	0.00	0.00	0.00	0.00	0.00	

Legends	Very Poor performance	Medium performance	Excellent performance

DANMARK AGREES FOR TECHNICAL & FINANCIAL ASSISTANCE TO WASA LAHORE

Syed Zahid Aziz Managing Director WASA Lahore and other high officials met with Danish Ambassador Mr. Ole Thonke at Islamabad for Technical and financial assistance for Waste Water Treatment Plant in Lahore city on 65% loan and 35% grant aid basis.

FRENCH AMASSADOR MET WITH GOVERNMENT OF PUNJAB TO PROVIDE SWTP IN WASA LAHORE

French Ambassador H.E. Mrs. Martine Dorance, met with National Assembly Speaker Mr. Ayaz Sadiq, for the development of surface water treatment plant in Lahore city, Managing Director WASA Lahore, Vice Chairman WASA Lahore and other high officials from AFD and Punjab Government also attended the meeting.

WASA LAHORE SOCIAL MOBILIZERS SET TO SPREAD AWARENESS

WASA Lahore Social Mobilization Team in coordination with Revenue office (AIT) conducted an awareness activity at moon market. The aim was to engage small commercial consumers to support WASA Lahore by paying water bills and protecting local sewage system by avoiding dumping solid waste in drains.

WSSC KOHAT DETERMINED TO RESOLVE WATER SUPPLY ISSUES

CEO WSSC Kohat visiting Garden Colony (densely populated inner city area), to look into the progress of resolving the long awaited problem of water supply. The problem is resolved by linking one of the nearby tube well to city reservoir.

WSSC KOHAT TO ESTABLISH DYNAMIC CONNECTION WITH LOCAL GOVERNMENT

CEO WSSC Kohat Mr. Arif Rauf, General Manager (E & S) Mr. Faheem Durrani and Manager Projects Mian Mohsin Gul briefing the newly elected District Nazim Mr. Nasim Afridi and other District Council members on the functions and achievements of WSSC Kohat.

CHINESE DELEGATION VISITED WSSC MARDAN

On 7th August, 2017 Chinese delegates of China City Environment Protection Engineering Co Ltd visited WSSCM Mardan for extending support in Waste Water and Solid Waste Management.

WSSC MARDAN TO SEEK ADB SUPPORT FOR WATER, DRAINAGE AND SOLID WASTE MANAGEMENT

Mr. Nasir Ghafoor Khan – CEO WSSC Mardan and Mr. Ayub Khan - Tehsil Nazim Mardan met with P&D Department Khyber Pakhtunkhwa Peshawar regarding approval of support by Asian Development Bank in Water Supply, Waste Water and Solid Waste Management.

WASA FAISALABAD SIGNED MOU WITH CHINESE COMPANY MASZ

On 17th August, 2017 seven members Chinese Delegation of MASZ Group visited WASA F headed by their Chairman Mr. Li & Executive Director Christina Yan. Mr. Faqeer Muhammad Ch Managing Director WASA-Faisalabad, signed three MOU's with Chinese Counterpart of worth PKR 38 Billion. **(1)** Surface water treatment plant. **(2)** Waste Water Treatment Plant at Chokera. **(3)** Extension of water distribution network.

WSS PESHAWAR

On 1st August, 2017 a delegation of Beijing Construction Engineering Group holding talks with Mr. Khanzeb Khan CEO WSSP. Delegation presented WSSP brief.

WASA HYDERABAD SIGNED MOU WITH ALLIED BANK FOR ONLINE BILLS COLLECTION SERVICES

The Ceremony for signing MoU between Water & Sanitation Agency, Hyderabad and Allied Bank of Pakistan was held on 18th July, 2017 for online collection of water & sewerage charges from the consumers, which was attended by Mr. Asif Bashir, Chief Commercial & Retail Banking Group, ABL, Mr. Sohail Aziz Awan, Chief Digital Banking Group, ABL, Ziya Sheikh Regional Head CRBG, ABL and Mr. Salman Akhtar, Regional Head Operation, ABL, Hyderabad and from WASA-Hyderabad Mr. Masood Ahmed Jumani, Director General, H.D.A and Syed Mohsin Nazar Jafri, Director Finance & Commercial, WASA, Hyderabad signed the agreement.

WASA HYDERABAD EXPERIMENTING WITH WOODEN MANHOLE COVERS

WASA Hyderabad is utilizing wooden manhole covers which is a new concept for other Water & Sanitation Utilities in Pakistan. Specification of wooden manhole covers:

1. Available in different dia i.e 24" 26" till 36"
2. Thickness of cover is 2.5"
3. Neem and Babber wood is used for the purpose
4. The Cover prepared in two pieces and joint from inner side.
5. Average cost is Rs.650/- to Rs.700/-

PSPC ORGANIZED PUBLIC HEARING AT BAHAWALNAGAR

A Public Hearing for Environmental Impact Assessment organizaed by Punjab Saaf Pani Company with public participation in presence of MPA Rana Abdul Rauf, MPA Shaukat Lalika, ADCG Buzdar & PSPC-South's Bahawalpur Regional office including Regional Director Maj (R) Khalid Khan for Provision of safe drinking water in District Bahawalnagar.

SAFE DRINKING WATER

About Article Writer:

Dr. Zainab Abbas Soharwardi joined WASA Lahore in 2007, and presently working as Chief Chemist in Water and Sanitation Agency (WASA) Lahore. She completed her PhD in Environmental Engineering in 2016. Her research area is Environmental engineering, Chemistry and Geochemistry. She is working on different projects related to ground water quality of Lahore.

The necessity of water to human health, population growth and economic development is never exaggerated. Safe drinking water supply is one of many significant environmental issues that governments, organizations and communities worldwide strive for every day.It is reported that 80% illness and over one third of all deaths in developing countries are due to water related issues. Due to unsafe water, one child dies after every eight second. Arsenic poisoning is considered as one medical condition which happens due to high intake of arsenic. Main basis of arsenic poisoning is from ground water that naturally contains high concentrations of arsenic.

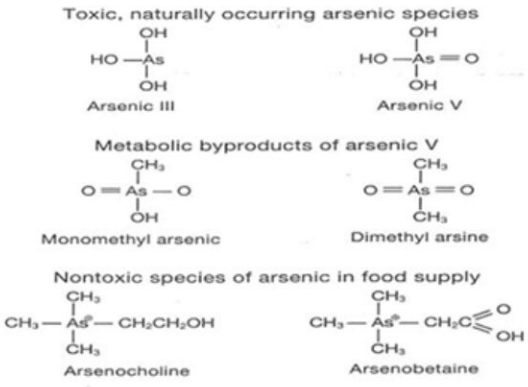
Almost 137,000,000 people in more than 70 countries are probably affected by arsenic poisoning from drinking water. In order to supply safe water to communities, a cleaner supply of water is crucial. In most cases urban dwellers rely on either surface water or groundwater or both as sources of drinking water. On average, groundwater is cleaner and safer than surface water and requires minimal However, in the

advent of climate change, reliance on groundwater due to dwindling surface water sources has led to over-reliance and sometimes over-exploitation of groundwater. Such activities have led to various perturbations of the aquifer dynamics leading to mobilization and enrichment of natural contaminants, such as arsenic. Distributed or piped groundwater is prone to microbial contamination, but safer than open well water. Disinfection of piped water, if not done properly, may have negative health impacts on populations Thus, monitoring and assessment of drinking groundwater quality from source and distribution system is inevitable. Groundwater contamination in Pakistan remains an issue worth investing research resources for the betterment of the population. Some cities in Pakistan rely heavily on groundwater resource.

As worldwide Arsenic (Shanghia) is one highlighted issue in these days.

Some of the areas in south-east Asia such as Bangladesh, India, Nepal, Myanmar, Pakistan, Vietnam, Cambodia and China have particularly high levels of As which is detrimental to human health. Almost 50% of the global rivers and lakes are polluted and which are badly affected aquatic environment and ecosystem of the areas and rivers are going to dry and water quantity is going to reduce every coming year. Due to contamination of ground water, agriculture is also badly affected in some areas; such as north China, USA high plains, India, Yemen and some other countries will be severely affected. Pakistan is also facing issues related to high arsenic in ground water. The total population of these 656 villages is approximately 6,173,680 and they are at risk from exposure to arsenic in their water supply.

Arsenic poisoning is considered as one medical condition which happens due to high intake of arsenic. Main basis of arsenic poisoning is from ground water that naturally contains high concentrations of arsenic. Arsenic generally occurs in two forms, pentavalent arsenic known as As(V) (arsenate) and trivalent arsenic known as As(III) (arsenite). In ground water arsenic may exist as trivalent and pentavalent arsenic, or a combination of both. Although both forms of arsenic are potentially harmful to human health, trivalent arsenic is considered more harmful than pentavalent arsenic. Arsenic can combine with other elements to form inorganic and organic arsenicals. In recent study it is observed that Lahore has As(V) which is less harmful as compare As(III).



Degree of toxicity is ranked as :As (III) > As (V) > Organic arsenic compounds.
Main toxic effects are caused by inorganic As (As3+)

Lahore is one of the major cities in Pakistan where groundwater resource is pivotal to development. More than 7 million people of Lahore city, Pakistan, use groundwater for drinking and other household Purposes. With its rapid population growth rate, the sole groundwater supply is under immense pressure. While abstraction rate increases with demand, recharge rate decreases with urbanization and industrialization due to a large part of land becoming impermeable. In Lahore we are facing two type issues related to ground water

1. Quantity of ground water **2.** Quality of ground water

Quantity and quality depend on each other. 10 years before when water level of Lahore was high then existing level, we were not facing any problem related to quality of ground water but with decline of aquifer, WASA Lahore is facing some issues related to quality of drinking water. However for arsenic and heavy metals

analysis it is necessary to choose standard and advance technique to get actual results because future planning depend on results which are being reported. Lahore WASA has done comprehensive study (by using ICP-IOS) on presence of arsenic in ground water and all sources are found up to 50ppb which is national standard in Asian countries i.e. China, India Bangladesh etc.

SUGGESTIONS

1. It is suggested to take remedial measures to safe natural resource and should adopt effective policies to refresh and recharge of ground water.

2. The differences in local geology should be considered when prospecting new tube wells (Sources) for drinking water.

3. Disinfectant reagents in distribution system of drinking water should be used on regular basis to remove microbial contamination.

4. For waste water disposal, effective treatment plants should be installed because seepage of waste water is also a source of contamination for ground water.

5. It is urgent need to monitor waste discharge from industries and should be properly treated before dispose of.

6. Use of fertilizers and pesticides should be controlled.

7. Treatment plants, air quality sensors should be installed to monitor environment pollution as air pollution also effect ground water through rain water.

8. It is suggested that for monitoring standard SOP and standard sampling procedure should be adopted.Standard Methods is a joint publication of the American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF).

9. Furthermore some projects to refresh aquifer can solve high arsenic problem in areas where arsenic is in alarming levels

10. Furthermore there is urgent need of to find economical solutions to deal with contamination in water and sediments.

DRINKING WATER MONITORING (STANDARD OPERATING PROCEDURES)

Sampling Procedure:

WHO sampling protocol should be adopted

Water testing parameters:

A. APHA, AWWA and WEF standard methods should be used to test water samples

B. Water sampling and analysis should be done by ISO-certified laboratories as unreliable results can create problems of pollution when corrective action cannot be taken in time. Sampling and monitoring tests should be carried out by qualified technicians.

C. Arsenic analysis should be analyzed by using ICP (Inductive Couple Plasma) Spectrophotometer.

D. According to National Standards for Drinking Water Quality (NSDWQ) there are more than 32 parameters to be analyzed furthermore selection of parameters can be done on bases of issues and demands.

According to ground water quality of lahore following parameters should be analyzed to ensure water quality of sources. (based on literature survey)

A. PHYSICAL PARAMETERS

1. Color
2. Taste, odor
3. Turbidity
4. Total hardness as $CaCO_3$
5. TDS
6. pH and conductivity

B. CHEMICAL PARAMETERS

1. Chloride	6. Magnesium,	11. Iron,
2. Sulphate	7. Fluoride	12. Lead,
3. Sodium	8. Nitrate	13. Mercury
4. Potassium	9. Nitrite	14. Copper
5. Calcium	10. Arsenic	15. Chromium

C. MICROBIOLOGICAL TEST

1. Coliform
2. E.coli
3. Fecal coliform

However organic parameters can be choose in case of objection in taste and smell in water sample.

AWWA Recommended SOPs for Water Testing

Sr. No	Test	Method used / Instrument	Sr. No	Test	Method used / Instrument
1	Alkalinity	Titrimetric standard methods	21	Total Iron	1.Reduction of Ortho-Phenanthroline method, 2. AAS
2	Chlorides	1. Argentometric method. Standard methods, 2. Turbidity of AgCl by Spectrophotometer	22	Manganese	Reduction of Periodic Acid
			23	Ammonium	Indophenol method,
3	Total Hardness	EDTA Titrimetric method	24	Ammonia	Adaptation of the ASTM manual of water and environmental technology,
4	Calcium	Titrimetric method	25	Copper	AAS
5	Magnesium	Mg, Calculation method	26	Fluoride	SPANDS method
6	Sodium	standard method/Flame Photometer	27	Silver	PAN method,
7	Potassium	standard method / Flame photometer	28	Nickel	Photometric method,
8	pH	Microprocessor PH Meter	29	Zinc	Adaptation of the Standard Methods for the examination of Water & Wastewater, Zincon method.
9	Conductivity	E.C. by conductivity meter	30	Lead	AAS or ICP
10	Turbidity	Turbidity meter	31	Arsenic	ICP
11	Odor	Sensory test	32	Mercury	ICP
12	Color	Sensory test	33	Chromium	AAS or ICP
13	Taste	Sensory test	34	BOD_5	5-Days BOD Test. wrinkler method
14	Temperature	By thermometer	35	COD	Reflux Method.
15	TDS	Standard method / TDS meter	36	Dissolved Oxygen	Standard method, Azide modified Winkler method
16	Total Solid	1. By evaporation method 2. By calibrated TDS meter	37	MFT	Standard Total Coliform Membrane Filter Procedure (Millipore filtration unit)
17	Total Suspended Solid	By evaporation method			
18	Nitrate	1. Reduction & Modified GR method by Spectrophoto meter, 2. Cd-Reduction method.	38	MPN	Standard Method for Total Coliforms Fermentation Technique (Bacterial Density)
19	Nitrite	Modified GR method.	39	TPC	Pour Plate Method.
20	Sulfate	Turbidity of B_aSO_4 / B_aCl_2	40	Residual Chlorine	By color comparison/comparator/DPD Method D.O meter/Titration Method

Ref:

- APHA (2012) Standard methods for the examination of water and waste water, 22nd edn. American Public Health Association, American Water Works Association and Water Environment Federation, Washington, DC
- APHA (2005) Standard methods for the examination of water and waste water, 21nd edn. American Public Health Association, American Water Works Association and Water Environment Federation, Washington, DC
- APHA (1978) Standard methods for the examination of water and waste water, 12thedn. American Public Health Association, American Water Works Association and Water Environment Federation, Washington, DC

PICTORIAL REVIEW OF PWON MEMBER UTILITIES RAPID RESPONSE DURING MONSON SEASON





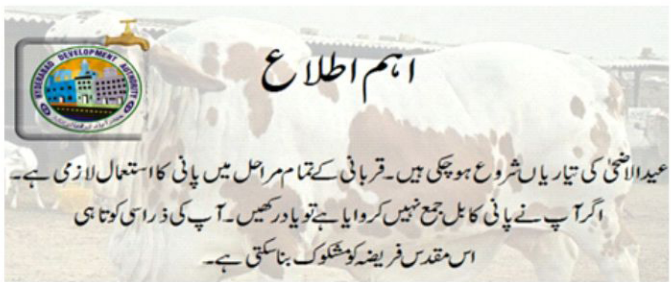









GLIMPSE OF EID UL AZHA CAMPAIGN



NATIONAL COORDINATOR

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