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Death by contamination

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Master of Science in Journalism



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DEATH BY CONTAMINATION

This research report is submitted to the Faculty of Business Administration as partial fulfillment
Masters of Science in Journalism degree

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Institute of Business Administration (IBA), Karachi, Pakistan

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Express Tribune

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Abstract

This research was conducted by Centre for Excellence in Journalism, IBA, Karachi during 2019 as a capstone project for Master of Science in Journalism. The data and information regarding water contamination was obtained and compiled through a thorough reporting, researched articles and documents provided by concerned organization.

The water which is used for the drinking purpose in Karachi is the most polluted and contaminated one as compare to the other cities of Pakistan. The reason behind this water contamination is the industries disposition of waste, which has ruined the environment by polluting the water bodies with its toxic effluent.

The disposing of wastage from factories has made the lives of the residents of Karachi miserable. Especially those who live around or near industrial areas. Many argue that the water they use for their livestock is not suitable for human consumption; hence, it gives birth to many diseases which can be fatal in many cases.

In this regard, the reports observe that the most affected areas by waterborne diseases in Karachi are Surjani town, Malir District and Korangi and Landhi Areas. This also includes small Goths situated around industrial areas.

Death by Contamination



A waterbody near Malir river has garbage and parasites crawling in it.

The great American poet, WH Auden famously observed, “Thousands have lived without love, not one without water.”

If Auden had been living in Karachi, he would have seen for himself how many die from lack of access to potable water. The country’s economic hub, which generates over half its revenue, is slowly but surely killing its own population due to the severe shortage of water, be it natural or manmade, as many proclaim.

In Karachi, access to clean water is directly dependent on your post code. For the privileged, paying premium for clean water has become a norm. For the have-nots, clean water burns more holes in the pocket – something they cannot afford.

One thing is for sure. If you live in Karachi, you do not simply open the tap and fill a glass of water. You must buy water for everything - from making tea and cooking food to bathing and sometimes even to flush the toilet.

In this conurbation of over 20 million, irrespective of whether you live in one of the posh localities or in a shantytown, you have to buy water from tanker suppliers. Sometimes you have to stay up all night waiting for the tanker because the business is thriving; the demand is greater than the supply, all thanks to water contamination, pollution, lack of investment in infrastructure and the decaying network of pipelines. Looking over it all is the mafia that controls the tankers and their nexus with the politicians who look the other way, while pocketing millions every month.

The larger debate, however, is not that of scarcity but that whatever water is provided in the name of “water supply” is contaminated and polluted. According to health experts at the Pakistan Medical Association, more than 30,000 people die every year, the majority of them children, in this metropolitan city because of the consumption of contaminated water.

Introduction

The Crises

Karachi's District West receives water from one of the six hydrants allotted for each district. However, more than 12 water hydrants operate in the city illegally. The problem of contamination of water find its roots in various factors. These includes illegal supply of water by tanker mafia, punctured pipelines for illegal connections, illegal sewerage connections and manholes, rusting and decaying water pipeline system, political rivalries, builders' mafia, water theft and others. The areas that are most affected by these factors in the West and South are Ibrahim Hyderi, Landhi, Shireen Jinnah colony, Akhtar Colony and Kashmir Colony.

Akhtar Colony

For Hassan Abbas, a resident of Akhtar Colony and father of three, life became even more difficult when he had to switch to bottled drinking water. The surplus expense of buying water from his monthly budget not only added to the financial burden on his shoulders but also shattered his dreams of providing education to his daughter.

“I had to pull out my younger daughter from school. My monthly income is Rs. 20,000 out of which I give Rs. 8000 for the rent of the house I live in, and now I have to bear the expense of water which is at least Rs. 2,500 per month. No matter how hard I try, I'll never be able to send my child to school”, said Abbas. (Abbass, 2019)



The residents of Kashmir colony don't give unfiltered water to their livestock as the water that comes in pipelines is hazardous for even animals' health.

Abbas's wife, who also works as a domestic help at homes in DHA, one of the posh localities in Karachi, says that every day she has to carry a heavy bottle home when returning from work. "My husband works till late at night, so I have to carry water bottles home after every day or two. It's a hassle and I am really tired of this routine," said Abbas' wife.



Children are carrying buckets to collect water is a common sight in Akhter colony

"Often when my children take a bath with the tap water, their skin becomes dry and it feels they have a layer of mud all over their body. I tell them to pour one jug of filtered water after every bath to wash-off the impurities of tap water," she said.

In the streets of the colony, the sight of children - girls and boys carrying bottles to the nearby shop is quite common. These shops they say provide "filtered water" which often comes in "sealed" containers.

While talking to CEJ, one of the shop owners said that their water is clean and safe for drinking.



A shop in Akhter Colony which sells filtered Water

“We have our water tested from PNS Shifa; it’s clean. One bottle costs Rs. 30 and for a small family, 3 bottles a day are more than enough if they use it for drinking and cooking,” said Shahzad, the shop owner.

Kashmir Colony

Kashmir Colony, which is situated close to Akhtar Colony, is facing a similar crisis.

“Sometimes the water is black and has a strange odor, just like sewerage waste. It takes a lot of time to clean the water tank, for which again we need a lot of water. We have stopped taking water from the line and now buy water for almost everything, from drinking to cleaning,” said Shakeel, a resident of Kashmir colony.

Another resident, Jahanzeb, who is also the prayer leader at a local mosque, said that when the water is supplied, for the first ten minutes only dirty and smelly water comes through the taps. After that it [water] get clear but it is very salty.

“Sometimes when we have to do wudhu [ablution] in the mosque, it’s a huge problem because the water is smelly and dirty. At home we can check the water before filling the tanks but

at the mosque they can't, because of which there is always smelly water in the tank. Sometimes we observe insects crawling in the water too which is an extremely alarming situation," said Jahanzeb.

The residents say that due to water consumption children mostly fall sick. Fever, gastritis and measles are common diseases in this area.

"In all, we receive clean water only for 10 minutes a week out of the half an hour that the water is supplied in this area. At times, the water comes in the line once a week only, sometimes twice, but there are also times when we don't get water for weeks. But what's the use when it's filthy water most of the time?" asks Shakeel, more to himself than anyone in particular.

The stagnant sewer stream that passes through Kashmir colony is another problem which the residents of Kashmir colony are worried about. People from the colony throw their garbage inside it. Heaps and mounds of garbage can be seen on both sides of the stream, while much of it floats on the surface. People living on both the sides of the stream have become immune to the foul odor that has become a permanent feature of the neighborhood. The open stream of sewage water also acts as the perfect breeding ground for mosquitos, leading to frequent outbreaks of malaria and dengue in the neighborhood.



A stream passing through Kashmir colony is full of garbage and sewage waste

“Not much has been done to clean this stream,” said Jahanzeb. “There are schools and mosques in this area, but no one has bothered to fix this problem faced by the colony’s residents. There is dirty water in the tanks and mounts of rubbish on the water body in the colony. It has ruined the normal watercourse and has polluted the area completely,” he added.

Water is mainly supplied in this area on donkey carts which carry small water tanks. The reason is the narrow lanes that are inaccessible to the much larger water tankers. Munir Khan, who runs one such donkey cart service, said that they buy water from the municipal supply service near Korangi road.



The line water in Akhtar colony is smelly and dirty and unsuitable for drinking or cooking

“KWSB provides water to these tanker service providers from whom we buy our water. One donkey cart tank costs Rs2,500. One family need at least 3 of such water tanks per month,” Khan told CEJ.

“We check the water before we supply it to houses and in mosques and *madrassah*, we supply water for free,” he added.

Health Risk

The high prevalence of waterborne diseases in Pakistan is directly related to the contaminants, such as municipal sewage and industrial waste, mixing with the potable water lines. According to the Pakistan National Conservation Strategy report, over 40% of the outbreak of diseases in Karachi can be attributed to unsafe drinking water. Another report states that more than 36% of Karachi water has pathogenic bacteria, which is deadly for human health. More alarming is the presence of fecal material in the water samples.

The microbiology department of Karachi University has also conducted several tests which reveal that even potable water is contaminated with harmful bacteria like *Salmonella typhi* and virulent strain of *E. coli*. (Daud, et al., 2017)

According to research undertaken by Karachi University's microbiology department, the common waterborne diseases in Karachi are:

- **Diarrhea**

According to World Health Organization's (WHO) annual report, it is a matter of high risk and grave concern that in Karachi alone, one in 10 people suffer from waterborne diseases every year. More than 420,000 people die every year around the world in which 125,000 are children. The water that contains bacteria, viruses and parasites, heavy metals and chemical substances causes diarrhea and 200 other diseases. The food which is grown and cooked in polluted water is causing 550 million people to fall sick. According to the statistics released by WHO, 230,000 deaths are reported due to food and waterborne diseases out of which 54,000 children die of diarrhea in Pakistan.

- **Cholera**

As per the WHO's research, Cholera is one of the major threats to public health world-wide. Pakistan is one of the countries where the number of cholera cases is on the rise.

It is an acute diarrheal infection "caused by ingestion of food or water contamination with the bacterium vibrio cholera," according to WHO reports.

The WHO estimates that every year, there are approximately 1.3 to 4.0 million cases, and 21,000 to 143,000 deaths worldwide due to cholera.

- **Hepatitis A and E**

Hepatitis A and E spread from one carrier to another via oral consumption or faeces. The major cause is the intake of contaminated food or water consumption. Absence of proper hygienic conditions and unhealthy routine of eating out are the major reasons for the high number of cases of hepatitis A and E reported every year in Pakistan.

- **Typhoid**

According to Dr Naseem Salahuddin of Indus Hospital, the bacteria *Simonelli typhi* which causes deadly Typhoid XDR is present in polluted water and polluted food cooked in contaminated water. "When a person has typhoid fever, this bacterium is present in the stool of the patient and eventually it gets mixed with the sewage. If this sewage water gets mixed with fresh water and a person consumes that water without boiling or filtering it, the same infection can be transferred to the one consuming the water," she said.

The symptoms of typhoid are high fever, headache, stomach pain, loose motions or in some cases constipation. Typhoid usually is diagnosed after 4 or 5 days of fever.

Speaking at the 5th international conference on “Environmental Horizon- Climate change and Health” at the University of Karachi, Minister for climate change Zartaj Gul Wazir said that unfortunately, we are living in times when we have to tackle the environmental degradation and climate change. She emphasized on planting more trees and encouraged students to participate in cleaning waterbodies. “It is sad that untreated wastewater is being released into the ocean, this should be treated as a communal problem”, she said. (Staff Reporter, 2019)

In the same conference, which was held on Jan 11th, 2019, Special health secretary Dabeer A. Khan said that Pakistan was going through an environmental degradation and because of that many health issues have arisen. He said that water pollution is one of the issues which is a matter of grave concern.

Drinking Water Quality

The presence of toxic metals, coliforms and E. Coli in the water sources is one of the common factors that causes a huge risk to public health in Pakistan. It has become a major threat as Pakistan is ranked 80 among 122 countries with respect to drinking water quality.

Akhtar Colony Health Stats

The most prevalent disease which has claimed many lives in the town is gastrointestinal tract disease. The poor sanitation conditions in the town aggravates hygiene issues. However, the reason for the fecal substances in the water is the faulty pipelines that provide water to the town. The water pipelines and the sewerage lines are intersecting each other. Therefore, there is continuous mixing of sewerage water with fresh water.

The Pakistan Medical Association issues a warning notice every year to take precautionary measures before monsoon against the possible outbreak of waterborne diseases. During the rains, there are higher chances of water contamination i.e. mixing of sewage water with potable water.

According to Dr Salman Shah, runs a private clinic in Akhtar Colony, “A number of people come to my clinic with diarrhea, fever, ulcer and gastritis. Majority of them are women and children as they are the primary consumers of water.”

Dr Salman says that areas deprived of proper sanitation and sewage drainage system fall prey to these viruses, which can sometimes be lethal.



The water supplied from tankers in Akhtar colony is also yellow in color

He added that people visiting from Punjab or other places in Pakistan are more likely to be infected by these viruses as compared to those living in the colony. People who are used to of living in such environment from childhood grow immune by the time they reach adulthood. Whereas there is a large number of people in this colony from south Punjab. When they get exposed to such unhealthy conditions and consume water, their system cannot handle it and they are more likely to get sick, he explained. (Shah, 2019)

Dr Hibba Siddiqi of Karachi Medical and Dental College concurs. “We receive a large number of patients who are diagnosed with typhoid, the reason for which is unhygienic practices, unhealthy food consumption and most importantly the consumption of contaminated water. The chemical and microbiological load in water is giving birth to several diseases which in future years can become a major problem in the mega city of Karachi,” she said. (Siddiqui, 2019)

Water Commission

In December 2016, a commission was formed after many complaints were filed against government offices in Supreme Court by the residents of one of the squatter colonies in Karachi.

The petition stated that “they are required to ensure provisions of potable water, sanitation and hygienic atmosphere to the people, but they have individually and collectively failed to discharge such fiduciary, statutory and constitutional duty”.

The judicial commission was formed the same year to investigate the issue surrounding the supply of contaminated water. The commission was headed by Justice Iqbal Kalhoro of the Sindh High Court.

In 2017, the judicial commission was livid when it found that 90% of the water supplied to the metropolis was dirty and unfit for drinking.

However, Syed Mohsin Raza, General Secretary of the KWSB’s People’s Labor Union, conceded that there is mismanagement. “I was happy when the commission was formed but unfortunately no substantial results have come out of this commission. The infrastructure will only be developed when people start paying the due amount and the beneficiaries stop filling their pockets,” he said.

According to Raza, the mixing of sewage water with fresh water is due to the aging infrastructure. The pipelines are rusting and since the water board is drenched in loans, it doesn’t have the capacity to build new infrastructure and install new pipelines.

“Water theft is common,” said Raza. “In many areas of Karachi, people don’t pay for water that the board supplies. There is a problem not only on the suppliers’ end but also on the consumers’ end,” he explained.

“It is beyond me that people of Orangi Town receive water after 45 days,” he remarked. “Why would they pay Rs116 when they don’t get water during the month? There is no equal distribution of water because of political and mafia pressures, no one is serious, the underground tanks of powerful people are filled but their greed is never fulfilled, but everything is blamed on the KWSB when our organization is a puppet in the hands of these mafias,” he lamented.

Even today, says Raza, the KWSB has little in terms of automation. The sanitation staff dive into the sewerage water which can be up to 30 meters deep, in order to operate the machines. “Lines get choked- we have a 60-year-old line system, our pumping stations and lines need to be changed,” he continued, the list going on and on. “The reason for the contamination and intersection of water lines with sewerage lines is because we have an old, rusted and flawed system and machines,” he concluded. (Raza, 2019)

Water Sampling

Water samples were collected by CEJ from Akhtar colony and Kashmir colony in pre-sterilized bottles in order to avoid contamination from the outside environment. They were sent to Aga Khan Laboratories for bacteriological analysis of total colony count, total coliform count, presence of E. coli and Fecal Enterococci.

According to the report in sample source of 500 ML water container:

Total colony count ----- 25 CFU/ML
Total Coliforms -----40 CFU/100 ML
Fecal E. coli----- ISOLATED
Fecal Enterococci----- NIL

The results of the sample suggested that water is bacteriologically unsatisfactory and the degree of contamination in the sample was high. There is presence of E. coli, fecal streptococci and enterococci which is suggestive of fecal contamination.

According to the research conducted by the environmental studies department of the University of Karachi, most water in Karachi which is supplied through vendors is not suitable for drinking. The water provided by municipality or through wells either contains coliform bacteria or fecal coliform or in some cases both. Some of the samples taken from the industrial areas also contained heavy metals including arsenic, nickel and lead which is hazardous for human health. Another research study, carried out by Amir Alamgir, found that 90.9% of water from Karachi's South district were contaminated with the organisms of higher-level contamination and the situation is alarming. Out of 100, more than 41 samples contained E. coli and coliform. The reasons for the highest level of contamination in the South and West district were poor sanitation conditions which has aggravated the problem. The damaged and crippled water distribution system and leakage in pipelines has exposed people to health problems which is linked with waterborne diseases. (Ilyas, 2016)

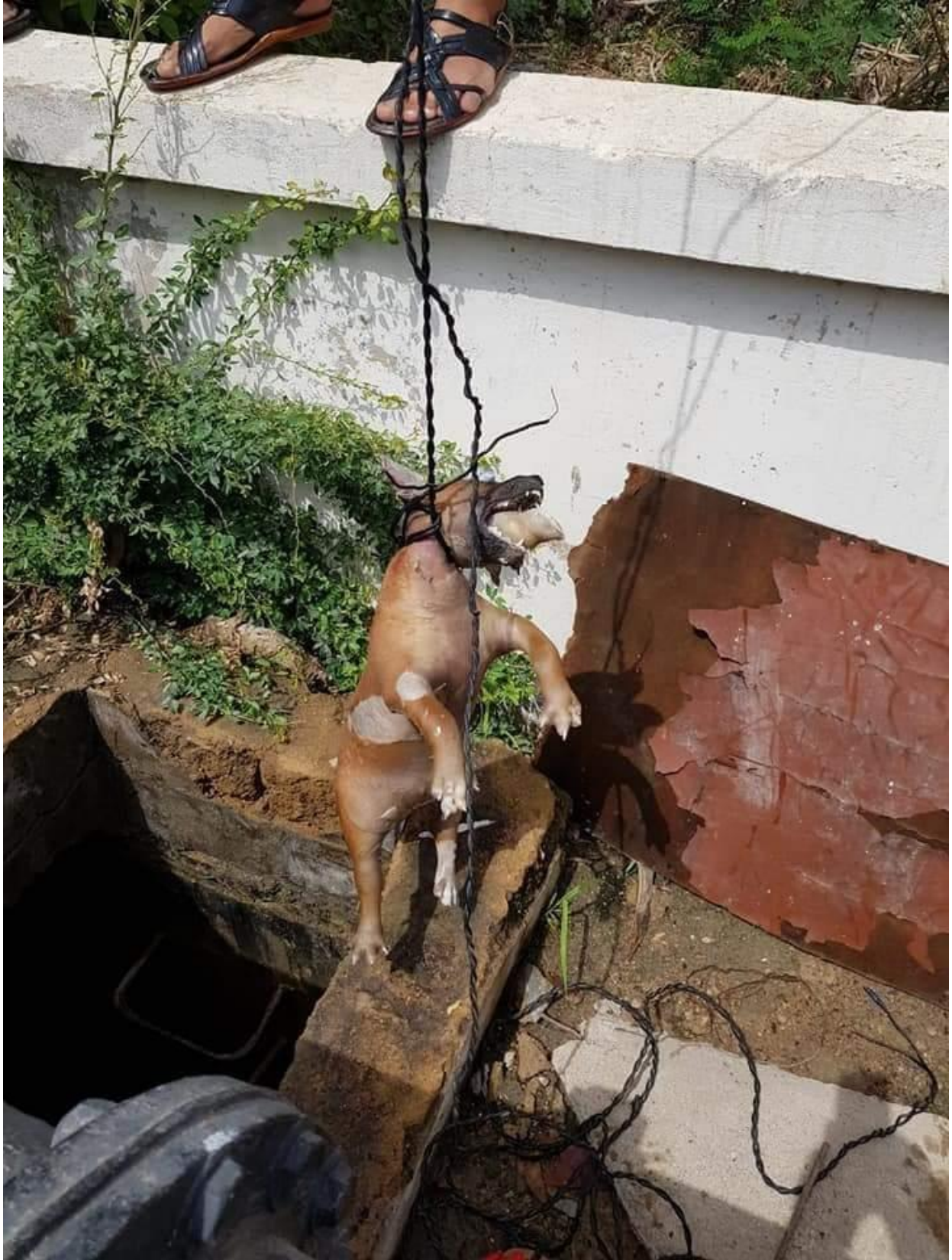
The Role of KWSB

The Karachi Water and Sewerage Board (KWSB) is solely responsible for municipal water supply and controlling wastewater and sewerage in the city. The body is particularly responsible for, potable water supply, its flow, triennial circulation, representation of tariff and retrieval of incomes, operation and conservation and also the supply of water tankers as an alternative are fundamental workings of the amenities provided by the KWSB.

However, the deteriorating and aging apparatus of KWSB is running out of capacity and is unable to manage the distribution, fix the decaying and rusted system of pumping machines, solve the alarming issue of water theft, mend leaking supply lines, curb the hold of tanker mafia, decrease dependence on tanker services and prevent the contamination and mixing of potable water with sewerage waste.

Cleaning of Hydrants

The impurities present in the water hydrants that provide water to Karachi has reached an alarming level. The risk of outbreak of disease in Karachi is on the verge. Last year a carcass of dog was found inside the *Sakhi Hassan* hydrant.



carcass of dog found in sakhi hassan hydrant, Image provided by Hamid Ali- Resident district central

The population of Karachi, which comprises millions, receives its water from six hydrants. According to media reports the supply to the district central which is the most densely populated district, has been suspended for the past several months by KWSB. The residents are forced to buy water from tanker service providers, who supply water from *Sakhi Hassan* Hydrant. They use this water for drinking, cooking and cleaning purpose. However, last year when a dead dog was found inside the hydrant, the cleaning arrangements of KWSB were exposed.

People living in the area near the hydrant complain that the condition of water hydrant is very bad- huge tanks are full of dirt and a stench is always emanating from the hydrant.

“This water is deadly. It’s full of impurities, and there is no maintenance or cleaning of water hydrant. People are buying poison in the name of water”, said Taj Haider, a resident of Gulshan e Iqbal.

The former managing director of KWSB, Hashim Raza Zaidi issued orders to check the hydrants on daily basis and ensure that they are clean. The practice discontinued with his term. The carcass of dog found inside the hydrant however is the evidence of the poor performance of water hydrant administration in Karachi.

On the other hand, Rizwan Hyder, spokesperson for managing director KWSB said that people cannot blame the government entirely as lack of civic sense and disloyalty towards government among the citizens is the major cause of water contamination in Karachi. “Karachi is short of water, when the pipelines are empty the citizens use donkey pumps to pull the water and because the pipelines are rusted and in a bad condition, due to pressure they pull the sewerage water into the fresh water pipelines and because of that the whole pipeline gets contaminated. People use all methods to pull water, they have illegal connections of both sewerage and water lines. The unreported pipelines can’t be managed. The equal and clean distribution of water is impossible with this level of corruption and disloyalty from citizen’s side,” He said He added that water theft is also a common factor- illegal manholes are not properly treated due to which they often overflow or leak in the ground. The sewage water than gets mixed with the water which pollutes the underground water resources.

According to Hyder, another important factor is the construction of high-rise buildings on small plots. “The connections were initially installed according to the size of the plot. Now due to builder mafia, 1,000 people are living on the plot where the connection was given for 16 to 18

people. When 1000 machines pull water from the lines, they start leaking and sometimes burst and the water gets mixed with the sewage water,” he said.

Hyder also said that people often make holes in the main lines for stealing water of one area. “We sometimes find metal plates and rubber slippers in the pipelines which people use to block the water of other areas, due to political grievances,” he said. (Hyder, 2019)

He also stressed that as long as people aren’t taught to have civic sense, the issue of water contamination can’t be resolved.

Overpopulation and Water Crisis

It is noted that when there is an increase in population per capita, water supply goes down due to which the stress and shortage increases. In Cape Town, all cities were running out of water and the situation only got under control when people, the corporate sector and other elements of society stressed on the conservation of water in the country.

KWSB’s Mohsin told CEJ that there are more than 600 *kachi abadis* inside and in the suburbs of Karachi, where there is no proper water supply through water board. These people buy the most expensive water in Karachi.

“These people pay a very high price for a 20 liter can, whereas in the posh localities like DHA and Clifton, people pay less for tankers. We need to convince and educate people that they should buy water through proper channel instead of pulling it through suction pumps which is polluting and damaging the already deteriorating system of water supply”, he said

They should pay for the water and sewerage facility, he mentioned. “We have around 20 pumping stations which are running 24/7. We charge Rs. 116 per month for water and also tow the sewerage in the same amount, but people don’t even care to pay that minimal amount to the government,” he said.

“Unfortunately, the sewerage water is also going into ocean without being treated,” he mentioned. “There is a lot of political pressure on KWSB which obviously affects the performance and hinders its growth, in my opinion, if there was an independent board than we would have been able to do our job in a better way. We don’t have control over many lines in various cantonments due to political parties’ pressures and holds,” he said.



Rusted and leaking pipelines in Korangi industrial area, provide water to District west

He told CEJ that the condition is beyond our reach. There are a lot of criminal factions involved in this matter. These powerful people take away all the water of Karachi, their areas have illegal water and sewerage lines, some of the hydrants are even controlled by these mafias and so, the cleanliness is difficult to manage.

Water and Women

Kauser is a 21-year-old girl and faces menstrual hygiene issues due to scarcity of water in her area. “This water is so dirty that during menstruation I use bottled water for cleaning. My mother scolds me every time I take a mug of drinking water in the bathroom and if I ever wash myself with this water, I feel unclean and dirty all day. My friends in neighborhood have UTI [Urinary tract infection] which is also caused by the usage of water that comes in the line mixed with sewage,” she said.



Women buy water and have to carry heavy bottle to their homes everyday

According Ms Seemi Kamal of *Hisaar* Foundation and PPAF, “Women are the primary consumers of water, yet their problems are often not addressed when we discuss scarcity and contamination of water on public forums”. According to her women should be talking about water problem more as its scarcity and uncleanliness affects them the most. (Kamal, 2019)

Another environmentalist Zehra Ali told CEJ that “women are generally not the decision makers in our society, they might be the consumers but as a consumer they deserve availability of clean water to ensure health. In rural areas women often travel miles to collect water for the entire family,” Said Zehra. (Ali, 2019)

Water and Children

Children anywhere in the world don’t deserve to drink water which contains other people’s excreta, being exposed to polluted water and skip school due to unavailability of water. In Pakistan, according to a report by WHO, the newborn and mother get infection from unsensitized delivery rooms which risks their health and wellbeing at the time when they are most vulnerable.



According to WHO stats and findings, “Globally, three quarters of sewer-borne wastewater (73 per cent) is estimated to undergo at least secondary treatment.”

In Karachi, however, most of the water goes into the ocean without even secondary treatment.

As per WHO “A total of 711 million people, over 90 per cent of whom live in urban areas, have sewer connections that do not receive the minimum level of treatment. Many more are connected to wastewater treatment plants that do not provide effective treatment or comply with effluent requirements”. (WHO, 2017)

Mr Farhan Anwar, an urban planner and environmentalist told CEJ that water gets contaminated continuously from the source of uptake from the Kotri Barrage right to the household of the user. “Surface water is drawn from Kotri Barrage via the KB Feeder Canal which is already contaminated from waste water coming from the Kotri Industrial area. Then the water is stored in the Keenjhar lake that is heavily contaminated - mostly because of raw, polluted agricultural waste discharge,” he said.

He also explained that during transmission and distribution water gets contaminated mostly due to cross connections - where a water supply source gets connected with a source of pollution. This happens when, for example, sewage water enters the water supply pipes through cracks as the infrastructure is old and in bad shape. At times you have garbage dumps resting over water supply lines and the pollutants seep into the water pipes.

“As water supply in Karachi is intermittent and not 24/7, and suction pumps are commonly used, vacuum and negative pressure gaps are created that also suck in sewage from lines crisscrossing water supply lines. Then at the household level water in underground tanks gets contaminated mostly by insects and cockroaches or dust”, he said. (Anwar, 2019)

Sub-surface water in Karachi is highly contaminated by mixing with sewage and at places near the coast by sea water intrusion into the aquifers.

Industrial Waste and Health Damage

The disposing of wastage from factories has made the lives of the residents of Karachi miserable. Especially those who live around or near industrial areas. Akhtar Colony and Kashmir colony are two of those areas, situated near the Korangi industrial area, and the water they get is often mixed with industrial waste. It is observed that the water they use for their livestock is not suitable for human consumption, hence, it gives birth to many diseases which can be fatal in many cases.



The toxic waste of leather factories mixing in water stream in Korangi industrial area

In this regard, reports observe that the most affected areas by waterborne diseases in Karachi are Surjani town, Malir District and areas close to Korangi and *Landhi* industrial area. This also includes small Goths situated around industrial areas.

According to research and reports by the water commission formed in 2017, there have been complains that children were getting sick and some even died because of the poisonous components present in drinking water. The environmental changes occurring because of water pollution have also affected animals.

Mr. Gul Hasan Kalmati said in the workshop, “Urban water dialogue”, at IBA, that water of Thaddo River, which is used for agricultural purpose, has destroyed the vegetation and cultivation in the area. The cultivation land in Malir district has lost fertility. Similar is the case with ‘poisonous water’ that the Aquafina plant (Pepsi) has been spewing over and because of which land, humans and livestock have paid a huge price. (IBA, 2019)

According to Sindh Environment Protection Agency (SEPA) and National Environmental Quality Standards (NEQS), it is illegal to dispose poisonous waste into open water bodies. (PROVINCIAL ASSEMBLY OF SINDH, 2014)

The researchers and environmentalists have also conducted a test of water samples and have come to the conclusion that the water consumed by people is not suitable for drinking.

Another study conducted by the students of University of Karachi investigates physio-chemical and public health profile of drinking in Malir District of Karachi.



Toxicities present in water contaminate the soil and makes it unsuitable for growing vegetables or fruits

According to Zehra Ali, environmentalist and founder of crops in pots, the vegetables grown in contaminated soil, as a result of water pollution, can be highly dangerous especially when there are traces of heavy metals in the water. “Tests are done in various localities in Karachi to check bio availability of these metals which indicate the level of toxicity,” said Zehra Ali.

“The Reason for Contamination is Scarcity”

While talking at the panel on Water of Karachi, at IBA, Mr. Syed Mohsin Raza, chairman labor union KWSB, said, “Currently we are receiving 500,000 gallons of water and also supplying it.

Our wells have dried up, mainly due to picking of raiti bajri. It is illegal and banned in all eras”, he said.



workshop on “Urban water dialogue” at IBA on 20th March 2019

He explained the how till 1996 Karachi was rich in betel leaves cultivation which used to take place in Malir district, “The former chairman of KWSB Mr Raheel Shah got rid of it because the cultivation of betel leaves or pan requires a lot of water.”

The water, [according to him] which was used was conserved for the supply to the residents of Karachi.

“Because of his firm decision the pan cultivation was completely stopped in Damloti,” he said.

While talking about the change in situation and time, the business of constructing buildings and housing schemes is thriving in Karachi. “Bahria Town is receiving water from the water board through pipeline 6 to 12 inches in diameter. Many mafias are working in Karachi, which include hydrant mafia, tanker mafia and now also builder mafia. Another problem, he mentioned, is

internal. “There are two types of officers working actively; first is the one whose job is to distribute, and supply water and the other is the one who works on projects to acquire funds. For one leakage in a pipeline, the water board gets Rs. 40,000 to 50,000, and if the leakage is caused because of a project then the received money is Rs. 200,000. There are specific people who look for funds and loans and that is the main reason for the devastation of the waterboard as an organization.”

Raza also mentioned about the Jica study. “The feasibility study on improvement of the water was a good study, which if implemented, things would have been way better.” He said that these days’ meetings between waterboard and world bank are underway. “It’s not the duty of managing director to tie the industry in more and more loans. New people take charge and the first thing they do is ask for funds and loans. KWSB is already drenched in 52 billion loan taken from Asian bank in 90s. We pay KESC 50 crores every quarterly for the Rs. 28 billion loan from KESC which waterboard has failed to return to date,” he said.

“KWSB needs 90,000 crores,” he explained. “Seventy per cent water is supplied to residential area which should be given in cheaper rate. Private companies don’t pay waterboard a penny. If the deserved payment is given than KWSB will be able to improve their infrastructure and work in better manner.”

The Water Supply and Filtration Process

According to the information provided by KWSB, the water is sent for the following tests before it is supplied to Karachi via two main points, Dhabeji and Keenjhar lake.

The water is tested for microscopic examination, physical and chemical examination and bacteriological examination.

Compiled from KWSB Request for proposal 2019

The Treatment Process

The first step is pre-chlorination. The reason of which is to neutralize organic and bacterial substances present in the raw water which is received in a distribution chamber. This process also optimizes the PH value.

In the next step, aluminum sulphate is added to be used as a coagulating agent. This is done before the flash mixer to have an equal distribution in the water storage. This process is known as chemical treatment of water.

It is then sent to the flocculation unit to be added to substantial and thick floc which is removed and separated in the sedimentation unit.

There are rapid sand filter beds which are used for further filtration and treatment of water reservoirs.

Once the water goes through all the chemical and other treatments, it is considered potable according to the standards of World Health Organization (WHO).

There are, however, some cases of contamination reported after the supply which require post chlorination to clean water from minor water pollution.

Guidelines for Water Filtration Suggested by WHO

The following processes are used by the municipal authorities for water treatment worldwide:

1. Pre- chlorination for algae control and arresting biological growth.
2. Aeration along with pre-chlorination for removal of dissolved iron and manganese.
3. Coagulation for flocculation or slow sand filtration
4. Coagulant aids or also known as polyelectrolytes – to improve coagulation and for thicker floc formation.
5. Sedimentation for solid separations that is removal of solids trapped in the floc.
6. Filtration to remove particles from water
7. Disinfection for killings bacteria viruses and other pathogens
8. UV Radiation
9. Reverse osmosis

Present Filtration Scenario

The 2018 filtration scenario as per the proposal document suggests that the filtration system of KWSB (Karachi Water and Sewarage Board, 2017):

The filtration system of KWSB includes of “clarifiers/ pulsators, chemical mixing/ dosing mechanism, disinfection facilities (Chlorination System), filter beds with filter media equipped with air wash and a wash water pump directly beneath the filters to a wash water holding tank”.

The document states that most of the apparatus and machinery installed for the filtration process has way back exceeded its amenity life. Most of the equipment’s for the water filtration process

are in a dilapidated condition. Filter piping gallery are mostly in poor condition and requires. The upgrade for the filtration apparatus is required in order to continue the work.

“Significant amount of pipe, fittings, valves, electrical panels, electrical equipment and wirings are in need of replacement due to corrosion, the cause of their severe corrosion in this area is likely due to a combination of chlorine vapors from the leaking pipe joints a, valves, and filter walls, the corrosive environment needs to be addressed in order to prevent future corrosion and proper operation of filter plants” [States the document].

The Weathering and rusting of the filter mechanism has destroyed the concrete body and material, piping and equipment in the filter gallery.

Details of Existing Filter Plants in Karachi

Sr. No	Location	Capacity (MGD)	Year Of Construction
1	COD	115	1962
2	PIPRI OLD	50	1971
3	PIPRI JBIC	50	2006
4	NEK OLD	25	1971
5	NEK- K 111	--	--
6	NEK- K 11	100	1998
7	HUB 80	80	2006
8	GHARO	20	1943
	TOTAL	440	

In order to improve the quality of water by the restoration of the present filter plants in the metropolitan city, KWSB has suggested to do measures to increase the capacity and thus ensure the supply of better water with the improved quality to the industries, domestic users etc.

Sources of water

The two main sources of water supply in Karachi are Keenjhar which is situated about 120 km from the city. The other one is Hub Dam which is also around 60 km towards the northwest of Karachi. The capacity of both the sources of water from where almost all the supply comes is

enormous where Keenjhar lake stands at 583 million gallons daily (MGD) and Hub Dam at 100 (MGD). This however with time has decreased noticeably because of the meagre conservation of water transporting machinery, water theft and the scantiness of the rainfall.

It is reported by KWSB that Hub dam which is a one of the major sources to replenish water to Karachi is only providing and restocking the city with only 24% of the original expected supply since the year 2014.

Not only that but Keenjhar lake is also running short of fulfilling the metropolis need for 580 MGD water and providing only 400 MGD to 415 MGD. This has been reported after the meters that are installed at the pumping station outside Karachi gave alarming results of water supplied to the city. According to Mohsin Raza, secretary of the people's union KWSB, the water is not supplied to the city as per its need. The shortage of water is due to the scarcity of water in both the major sources of water for Karachi.

“The dam was constructed in 80s and since that time water level is decreasing at a substantial scale in the Hub Dam. The catchment area of water which is 3,410 square miles have received a very small amount of rain in the past few years, the water rises only 5 feet above the dead level. If there were more rainfalls and the reservoirs could be stored on maximum scale than it has a capacity of storing water 64 feet above the dead level”, said Raza.

Keenjhar lake, therefore, is the major source of potable water supply to Karachi. With the capacity of 0.534 million acre-feet (MAF) to carry water through which 0.392 MAF can be taken and carried out of the lake through the means of canals. Built in 1950s and spread over more than 60 sq. km, Keenjhar is an artificial lake 3 natural lakes of Sindh Sunehri lake and kalri lake were brought together and linked with the river of Indus. This lake served as a reservoir and water was transported from it to domestic, commercial and industrial consumers in the metropolis. The water from the lake was also used to irrigate 351,000 acres of land in Thatta, the district of Sindh. 9,100 cubic feet per second of river water is carried by one of the canals originating from the Kotri barrage at River Indus. It is known as Keenjhar-Baghar (KB) Feeder (upper). The lower feeder carried the water from the lake and another canal and transports it to the cultivation land in Thatta District.

The water travels to Karachi through the system of canals. The distance which the water travels is around 129 kilometers. 49 Km out of 129 that the water covers is open canals. Chilya

lake is one of the open sources at the southern end of the lake from where 29 kms long keenjhar-Gujjo canal originates.

According to the engineers at KWSB maintenance division, the canal was constructed in the year 1978 before that KB feeder Lower canal used to supply the water to Karachi.

The bank of the KG canal was renewed with concrete in the year 1993 and, in 1997, authorities developed a further 250 feet of land on the sideways of its to provide extra protection to it from soil erosion and enable its conservation and filtration. On both sides of the canal, one would find number of fish farms, all these bodies receiving water from the canal. Farmers are also often seen using water from the canal to irrigate their cultural land and fields.

Rizwan Hyder, the spokesperson for MD KWSB told CEJ that the water received by fish farmers and farmers of cultivated lands acquire a high amount of water from the canal. He said that this is an estimated more than 5% of the total water which flows through the KWSB system from the major Keenjhar Lake. “some farmers use diesel engines to pull water from the canals, this theft of water has increased over time and paramilitary rangers had to be deployed to control the menace of water theft. Many culprits have been arrested in the process,” he said.

The Bigger Picture

As per statistics presented by World Health Organization, every year more than 3.4 million people die due to waterborne diseases, which occur due to water contamination. It has now become the leading cause of mortalities in the world. The victims are mostly children under the age of 5. The major cause of deaths reported is the consumption of polluted water, which contains organisms that thrive in water due to mixing of sewage water.

Ms. Seemi Kamal says that “Every country in the world has water contamination problem. They sit down, they talk and sort out the problem. In Pakistan we say that Indus water treaty was better than water accord. We can fix the water accord, what is there to stop us?”



Donkey cart water service in Akhter Colony, the price of one donkey cart water tank is approximately Rs.2000

“Yes, it is the government’s responsibility,” she said, “to provide water to the citizens according to the quantum of water set by human rights commission per day, and the only way to control it is to price any amount of water above that set quantum. This is the principle which is used across the globe and we should be able to do that too. We also need to fix whether the fixed quantum of water is 50 gallons per day or 20 gallons per day. James Vest says 20 gallons per day is enough for a person so why we are using 50 gallons per day? Citizens should also take responsibility.”

“The problem of water contamination begins with scarcity. We need to address this problem first. We, as citizens, wastewater in this city where one half has no water to drink and the other half wastes water beyond imagination. Why one needs to wash houses and cars? Why is water running on the streets? It is against the law to use suction pumps; every home has a suction pump. We shouldn’t just sit back and say that there is nothing to be done, we need to sort out this problem, this city is governable- it is manageable”, she said.

She also said that it is wrong of us to put the entire blame on the government. “Yes, they are corrupt, yes, they are part of the mafia, but look at the pressure under which they work. I feel sorry for the officers of Karachi water and sewerage board, for the kind of board they have and the kind of political instructions they receive almost every day”, she said.

Ms. Kamal insists that if KWSB is a government entity, that doesn't mean it will not work. While giving the example of Singapore, Ms. Kamal said that they have sorted out their water problem. She said that the water is fully owned by the government. The difference they made was that the water they drink is all recycled water. By changing the way, the utility is run, they have taken care of water shortage. She also mentioned that having a corporate model doesn't mean that there is monopoly of government over water.

“In Pakistan we have turned around KESC, we have also turned around PTCL, we cannot turn around KWSB just because we wish to do so. What we need is a new social contract, in which citizens play their rightful role and the corporate sector and government sector play their roles. There should also be a place for multilaterals and bilateral to help us out on our terms and not dictate us”, she said.

During the talk, Ms. Kamal stressed on many issues. She mentioned that organizations like WHO are aware that as much as we need them, they also need us. She also said that “instead of dividing the city into 6 districts it should be managed as one entity and everyone must get free water up to the human rights quantum and for more, everyone must pay. If they don't then there must be penalties against them. The rest of the world does it, we are not unique.”

She pleaded that academia needs to play its role to bring out the kind of people that will service the water economy of this city, which means waste water recycling, filtering, not polluting the waterbodies and resources and teaching the society how to live with less water and maintain hygiene. (Kamal, 2019)

Professionals, environmentalists, doctors and other government authorities have shown dissatisfaction over the present condition and quality of water being supplied to Karachi. They suggest that civic agencies must take care of the water filtration system. Replacing chlorine with the chlorine oxide is considered much safer. The experts say that chlorine oxide doesn't produce a substance in the water which is bad for health of humans.

The over-all picture suggests that it's not just the government responsibility but also the civic sense, and societal responsibility which needs to be taken care of.

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