



Center for Global & Strategic Studies

Contemporary Water Scarcity Problem in Pakistan
and Issue of Safe Drinking Water: What can be
Done?

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Clean drinking water is a basic human need. Almost 70% of the human body is composed of water which underscores the significance of this entity for life on earth. All the living things depend on water to carry on with their life processes, therefore,

water serves as a key component of primary health-care facilities. Beside human consumption, adequate access to water for all the major sectors namely; agriculture, commercial and domestic, is the top requirement of the modern world in which we live in.

Water Availability in Pakistan

It incurs a pinnacle of pain to see Pakistan moving towards being a water-scarce country as the water availability per person has declined from 5000 cubic meters in 1951 to 1100 cubic meter in 2015. According to Pakistan Council of Research in Water Resources, Pakistan will become an absolutely water scarce country by 2025. Unlike the recommended water storage capacity of 1000 days, Pakistan's storage capacity stands at a meagre 30-day supply. Climate Change and water security

nexus has further widened the supply demand gap by reducing the available fresh-water in the Indus River which makes water resource management a complex



problem. Lack of safe drinking water is a leading cause of threatening diseases among the people of Pakistan. In this regard it has engendered a huge disease burden on the country's economy. Providing piped networks to the dispersed population in rural areas will be expensive and still not be able to provide expected health gains even with large investment. Relying on time and resource intensive

centralized solutions will leave millions without safe water. So, the need of self-sustaining, decentralized approaches is inevitable (Mintz et al., 2010).

Poor water quality is among the most important issues that needs to be addressed. United Nations Organizations has reported in 2002 that every one out of five children in Pakistan is dying from water-borne diseases. Around 1.1 billion men, women and children worldwide are unable to drink safe water. According to Water Aid (2014), 16 million people in Pakistan have no choice but to rely on unsafe drinking water for their survival. Inadequate access to safe water gives birth to a plethora of lethal diseases including diarrhoea, typhoid, skin cancer etc. Though huge water resources were present in the Indus River system but during the last



decade, drastic change in composition of ground water quality has been observed. Now a days Pakistan is embroiled in issues pertinent to the quality and quantity of drinking water. Contamination of groundwater as well as surface water resources by microorganisms and toxic metals is the forerunner for acute and chronic diseases. Inadequate waste management system causes percolation of leachate into soil leading towards ground water contamination. Water contamination leads to various socio economic and environmental problems. Water supplied through

distribution networks is of substandard quality because of poor networking of supply lines. Close proximity of the supply lines with sewage lines often results in mixing of sewage water with drinking water owing to holes in the pipes. Hence, ground water, which is the prime source of clean water in Pakistan, is rendered unsafe for human consumption due to presence of substantial amounts of chemicals such as pesticides, mercury and cyanides, industry waste and solvents. According to World Health Organization, water related infections are the reason for 25 to 30% of the total hospital admissions and causes 60% of the total infant deaths. Considering these imminent water crisis scenarios, it is believed that there is a large room for improvement in the water sector of Pakistan.

Tapping into Innovative Technologies

A trenchant analysis of existing water purification technologies reveals that none of the available technologies are free from shortcomings. This fact precludes wide spread adoption of the point of use technologies by the general public.

Following are the available water treatment technologies which can be compared on the basis of their efficiency, cost and many other parameters.

- a) **Reverse Osmosis** is most effective method but it is not widely used because it is expensive and energy-intensive. Proper quantity of minerals are important in drinking water but reverse osmosis causes demineralization and results in poor taste. Cost of treated water using reverse osmosis is PKR 1-4 per liter (Watertech, 2015).

- b) **Solar disinfection (SODIS)** is often considered as cheap and an effective method for disinfecting water in countries that get sufficient amount of sunlight. Nonetheless, solar disinfection demands a laborious job of filling a lot of plastic bottles every day and putting them on the rooftop which people do not bother doing. Cost of water treated using solar reactor is PKR 0.2 per liter (Jaswa et al, 2010).
- c) **PuR Sachets** are expensive, laborious and produce undesirable taste. Cost of treated water is approximately PKR 0.8 per liter (Harris, 2005).
- d) **Pureit by unilever** consists of a filter kit that needs to be changed every 6 months and thus it adds to the overall cost of treatment. Cost of water treated is approximately PKR 0.55 per liter. (PATH, 2010)
- e) **Bio-sand filters** are heavy and difficult to operate. Furthermore, they require start-up procedure that people will not bother doing. Cost of treatment is PKR 0.2 per liter (Jaswa et al, 2010).
- f) **Ceramic filters** are cost effective but require high maintenance. Cost of ceramic filters is PKR 0.04 per liter (CDC, 2012).

Recommendations

Keeping in view the projected scarcity of water in Pakistan following suggestive measures can be taken:

- a. The biggest tool to solve the problem of water scarcity in Pakistan is through education. Creating awareness among the masses about water conservation

techniques is the best way forward for us. In this regard, positive role of governmental policy-makers needs to be highlighted.

- b. One of the solutions to the above mentioned problem is the integration of existing Point of Use Treatment (POU) technologies that have emerged as reliable approaches allowing people and communities to access safe drinking water at house hold level. However, working only as a stand-alone treatment, these POU treatment technologies do not provide an effective solution, so, there is dire need for technology that will effectively treat water at point of use for human consumption that is low maintenance and energy free. Therefore, there is an exigent need to improve the efficiency of POU treatment systems by providing some enhancements like thermal enhancement, optical enhancement, catalytic enhancement and oxidative enhancement.
- c. Sustainable irrigation practices should be practiced as agriculture sector takes up 96 % of the available water in Pakistan. Having the fourth largest canal irrigation system in the world, Pakistan has prodigious potential for saving water by incorporating efficient irrigation methodologies such as drip irrigation and sprinkler irrigation. Huge amount of water that is otherwise wasted through leakage and seepage from unlined canal system, should be conserved.
- d. Use of Solar Disinfection to treat contaminated water is a boon for a country like Pakistan as solar energy is a renewable energy source which provides treatment without any operational and maintenance cost. Hence solar-

powered purification technologies for water disinfection should be promoted and installed for the use of general public.

- e. Water sector of Pakistan should incorporate information and technology (ICT) solutions which is only possible through effective collaboration between the pertinent governmental institutions and academia. Both governmental and non-governmental institutions should emphasize on the use of software systems to detect leaks and damage.
- f. Ground water is the biggest source of drinking water in Pakistan so conserving and protecting this blessing is of paramount importance in pulling Pakistan out of the list of water scarce countries. Infiltration of toxic plumes which eventually enter ground water end up polluting underground water aquifers, hence uncontrolled infiltration needs to be prevented.
- g. Development of wastewater treatment technologies to reclaim and reuse water for irrigation purposes should be promoted. One such treatment facility is adopted by *National University of Sciences and Technology*, where a constructed wetland is designed for the treatment capacity of 77000 gallons per day.

Conclusion

In a nutshell, solving water scarcity issue in Pakistan demands multi-facet solutions. Our country is suffering from history' s worst water crisis that requires coordinated efforts at multiple fronts; individual, community, tehsil, district, provincial and national. There is a need to create public awareness through capacity-building

trainings and workshops on efficient water resource management by the experts and integration of already existing water purification techniques in order to develop viable solutions that are cost-effective and efficient in treating water for drinking purposes. If every one of us makes a firm conviction to stick by the principle of *Reduce, Reuse and Recycle*, I am positive that we will come out of this menace in no time!

