



Seminar Brief



“Arsenic Groundwater Pollution in Pakistan: A Growing Health Threat”

This brief is based on the research work presented by Dr. Abida Farooqi at the Centre for Environmental Economics and Climate Change (CEECC), PIDE.¹ The researcher discussed various sources of arsenic such as it is present in the earth crust, industrial waste, and burning of fossil fuels through coal. Arsenic from all these sources is added to environment and to ground water. There are serious health effects of arsenic as it can cause skin cancer. Kidneys and lungs absorb arsenic, and it accumulates there resulting in lungs and kidney cancer as well.

Arsenic is hard to notice in drinking water, as it has no color, taste, or smell. Hence, we don't notice its use if we take arsenic through drinking water. It is quite possible that apparently dirty looking water may not have arsenic, but apparently clean looking water may carry arsenic. Even if we drink arsenic water for 10-12 years, there are no apparent symptoms. However, in later stages, skin might get patches indicating arsenic presence. Quite often, people might get it confused with some other skin disease. Lack of awareness does not allow people to notice the presence of arsenic in water.

The entire world is facing the problem of arsenic water, however, this issue has become rather severe in South Asia particularly in Pakistan, Bangladesh, India, and Nepal. The entire Indus Basin in Pakistan is contaminated with arsenic. Human population settles down where freshwater is available, and normally population density is high near rivers. Research shows that arsenic concentration is higher in river areas. India has the highest number of population exposed to arsenic,

then comes Bangladesh and Pakistan. More than 200 million people are affected by arsenic worldwide and 90% of them are residing in South Asia. The problem started in Pakistan in 2000, however, less attention has been given to resolve the issue in the past two decades.

Research shows that arsenic As^3 is more toxic compared to Arsenic As^5 . There are many geological reasons for such findings, one main reason is that As^3 is more mobile compared to As^5 which makes it more toxic. Arsenic is present in organic as well as in inorganic form. Each of its form is toxic, but our body removes the organic arsenic through urinary function. On the other hand, inorganic arsenic accumulates inside body overtime. Natural sources are the biggest cause of arsenic water. Further, there are anthropogenic factors as well spreading arsenic in water. Arsenic salts have been used for preservation purpose, it is used in furniture market as it prevents furniture from bacteria and fungus.



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The World Health Organization (WHO) states that arsenic limit in drinking water is 10 microgram/liter worldwide. According to the National Environmental Quality Standards, the limit in Pakistan is 50 microgram/liter and we need to rethink about this limit, which is far higher than the world limit of 10 microgram/liter. A few countries are even trying to reduce the arsenic limit less than 10 microgram/liter in drinking water, while others arguing for no arsenic in drinking water at all.

In Pakistan, Punjab and Sindh provinces are more affected from arsenic than other provinces where its concentration level is quite high. Ravi river area is more affected than any other river areas in the country, and Lahore is the most contaminated city in the country. Although the 10 microgram/liter is the WHO accepted limit, the researcher has seen its concentration limits up to 3,000 microgram/liter in Lahore.

In Pakistan, the researcher finds that doabs are safer than rivers as 86% of the wells in doabs are safer in Pakistan.² There are geological reasons for these findings. Most of the wells in Pakistan are shallow wells, and there are limited deep wells in the country.³ Tube-well boring is expensive, and villagers don't get boring more than 50-60 feet deep as they can get water easily at the level. The researcher finds that shallow wells are more contaminated compared to the deeper ones.



In phase 1, the researcher did the blanket testing in 300 villages of Punjab (Pakistan) where the researcher tested more than 25,000 well. In phase 2, the researcher conducted a response survey in 5 villages. The results show that around 63% of previously contaminated well owners switched their wells with a safer facility. The remedial way to avoid arsenic is switching from one water source to another (such as water sharing with neighbors, or constructing a new well).

Recommendation:

- Lack of education, and limited awareness do not allow people to notice the presence of arsenic in water. Launching the appropriate health education campaigns in the affected areas would raise awareness in citizens about the issue.
- There is a dire need to address this issue on urgent and regular basis. The first step can be initiated with field-kit testing of affected areas.
- Pakistan has a high accepted limit of arsenic in water, encouraging the construction of deep wells would reduce the arsenic in water.
- Government should facilitate the alternative sources of drinking water in affected areas. The financing requirements of new wells can be facilitated through the public-private partnership. Alternatively, a community well can be provided with minimum expenditures where people can obtain clean drinking water.

²Doab is a term used in the Indian subcontinent for the water-rich tract of land lying between two converging, or confluent, rivers.

³A 100-120 feet well is defined as a shallow well, a well above this limit is defined as a deeper wells.