

# Thirsty megacities poisoning rural groundwater: study

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A massive drawdown of water beneath delta-based megacities across the world may be pulling surface pollution deeper into the ground, risking contamination and health problems for local populations, a new study said Tuesday.

Research led by Holly Michael of the University of Delaware in the United States used the example of Bangladesh's capital Dhaka to show how unsustainable water use was exacerbating arsenic pollution.

Water consumption in greater Dhaka, home to some 18 million people, is lowering the local water table by more than three metres per year in some areas.

Slaking the capital's thirst is driving down shallow water contaminated with arsenic—known to cause a host of deadly [health problems](#).

Using a new method for calculating water flows, the researchers showed that deep sources of clean water outside the capital could be polluted "within a decade," said the study, published in *Nature Communications*.

Previously, scientists had said it would take up to a century for contaminants such as arsenic to infiltrate deep groundwater at least 150 metres below the surface.

"In highly populated deltas and river basins worldwide, water resources are stressed and surface pollution is widespread," said the study.

"Pumping to supply water to megacities in these regions—even in the water-rich system of the Bengal Basin—threatens the safety of regional groundwater resources by inducing fast transport of contaminants to depth, even in areas tens of kilometres outside city limits."

Bangladesh's arsenic problem dates back the 1970s, when the government drilled several million shallow tube wells to provide villagers with water free of bacteria and viruses.



Arsenic poisoning in rural Bangladesh's groundwater has been a known health hazard for at least two decades, and is blamed for the death of more than 40,000 people every year

### **Water level down 60 metres**

What officials did not realise at the time was that the soil was heavily laced with naturally-occurring arsenic.

This led to digging ever deeper wells to reach untainted water.

But now these newer sources are also threatened.

"Little attention has been given to the potentially catastrophic impacts these hydrological alterations can have on the [water resources](#)" of rural and semi-rural areas where water treatment may not be possible, said the

study.

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Chronic exposure to the grey-white mineral is linked to cancers of the liver, kidney and bladder, as well as heart disease.

Michael and colleagues used regional data to devise a new way to analyse [water flows](#) in natural aquifers, natural interconnected layers of rock that accumulate rainfall and river water.

Over the last half century, the water table under the capital has declined by about 60 metres.

Nearly half a billion people live in 50 deltas around the globe, most of them concentrated in megacities.

The availability and status of surface [water](#) supply will be aggravated by climate change and rapid population growth, the researchers note.

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