



How is the UAE Dealing with Rising Groundwater?

Scientists from the UAE University (UAEU) are working alongside Abu Dhabi Municipality to find solutions to the emirate's rising groundwater problem. Each year, the lowlands of Abu Dhabi can find themselves flooded underneath excess groundwater for as much as 10 months out of every 12.

Of course, the national capital is far from the only city in the Middle East that must grapple with similar problems. The researchers working on a twin set of solutions in the UAE are hoping that one of the two avenues (or perhaps both) can provide a blueprint for others to follow, should they meet with success.

A regional dilemma

Excess groundwater is a problem for many cities throughout the Gulf, thought to be caused primarily by leakages in their water network systems and from irrigation overflow. However, there is often an impermeable layer of soil or rock in place, which prevents the excess water from filtering through the aquifer.

This is most observed in coastal locations, where the aquifer is shallow and thin and the bedrock impermeable. The aforementioned factors can lead to rising groundwater, but the problem is also exacerbated by infrequent (but sometimes intense) periods of heavy rainfall. In areas where drainage systems are inadequate to deal with the problem, it can be impractical to build new ones – meaning the groundwater has nowhere to go.

A twofold solution

In tackling the issue, the team from the National Water Centre (NWC) at the UAEU investigated two different techniques. The first involves borrowing a page from the playbook of oil exploration companies, by drilling several shallow wells in the vicinity of the affected area, then pumping the water out of these and replacing it with the groundwater to a far deeper profundity. While the shallow wells would only reach a maximum of 25m, the injected water could penetrate as far down as 1,200m with the aid of gravity.

The second solution would be repurposing the collected groundwater for use in artificial ponds, lakes and reservoirs. This avenue would be preferable for the authorities, since it would give the groundwater a practical, aesthetic use. However, it



would be the more expensive of the two options, costing an estimated \$2.45 million in comparison to just under \$1.4 million for the other solution.

Collaboration key

The NWC research team are very comfortable in discovering solutions such as these, since their specialities lie in [ensuring drinking water contains only natural, beneficial ingredients](#), treating wastewater and working out contingency plans for excess groundwater or surface water. However, they were quick to point out that collaboration was key to delivering the desired outcome in this instance.

“Without them [the Abu Dhabi municipality and other government departments], how would we know that we have to drill to 1,200m to discharge the collected water?” [explains Professor Mohsen Sherif](#), an expert in the field who has worked at UAEU for almost 20 years. “The government is now really putting a lot of emphasis on collaboration with universities in the country in order to utilise the available expertise and resources, especially in areas of national priorities.”