

IIT Madras team comes up with device that generates potable water out of thin air

Atmospheric Water Generators (AWG), the brainchild of Ramesh Kumar, T Pradeep and Ankit Nagar, who founded Vayujal Technologies Pvt Ltd in September 2017, harness the moisture in the air to provide potable water.



The machines tap potable water using humidity from the atmosphere. Express Photo: Vayujal

A PhD scholar, an MS scholar and a professor from the Indian Institute of Technology, Madras (IIT-M), have come up with a novel way of tackling the ongoing water crisis in Chennai through atmospheric water harvesting.

Atmospheric Water Generators (AWG), the brainchild of MS scholar Ramesh Kumar, professor T Pradeep and PhD scholar Ankit Nagar, who founded Vayujal Technologies Pvt Ltd in September 2017, harnesses the moisture in the air to provide potable water.

“The inspiration for atmospheric water harvesting comes from coastal deserts, where beetles and banana leaves, which are present in nature, harvest humidity efficiently. It inspired us to make a new surface using nano and micro engineering and come up with something that enables faster condensation,” said Ankit Nagar.

Water is derived from the AWGs using a three-step procedure. First, air enters the contraption through a filter situated in front of the machine. Secondly, the moisture in the filtered air gets condensed on nano-engineered surfaces present inside the machine. And lastly, the water that is collected is subsequently purified and mineralised to deliver drinking water.

Currently, a prototype machine of 100 litres has been deployed at the IIT-M campus and a few other places in Chennai. The company also has prototype machines with capacities of 400 litres and 2000 litres. A 100 litre machine costs about Rs. 1.5 lakh, while the operating cost ranges between Rs. 1.50 to 2.50 per litre.

“We have machines of variable capacity to address different requirements from different sectors. The requirements of residential buildings, corporate offices, guest houses, restaurants and schools vary from one another”, said Ankit.



Different machines are being developed to cater to different sectors of the economy. Express Photo: Vayujal

According to Ankit, all the machines can run on solar power, thus making them completely off-grid and requiring minimal maintenance. "The AWGs are cheaper than Bisleri water but the quality of mineral water remains the same", Ankit said.

The performance of the AWGs depends on the moisture present in the air, which varies from coastal areas to extremely arid regions like in Rajasthan. Ankit said that Vayujal's research team was currently working on developing a more cost and energy-efficient machine for areas in Rajasthan.

On what sets Vayujal apart from other international companies delivering a similar product, Ankit said, "Vayujal is unique since the nanotech involved enables faster condensation. This brings down the cost of drinking water and the operational cost and saves up electricity as well."

Ankit said the ongoing water scarcity motivated the team to develop something that can be used as a personal water source. "You can run it and get water anytime because air is completely free of cost and there are billions of litres of water available in the atmosphere that can be used for drinking purpose," he said.