

#CleanAndNatural

How to purify wastewater using just plants

Israel's Ayala Water & Ecology has an all-natural, maintenance-free system for water cleansing and reuse at farms, homes, factories and public parks.

By [Abigail Klein Leichman](#) | NOVEMBER 5, 2015, 7:00 AM



Graywater from a Tel Aviv apartment house is treated for reuse in this Ayala landscape element on the grounds. Photo: courtesy

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Unleashing the power of plants to purify wastewater – without pipes, pumps or anything else manmade – has proven a winning proposition for Israel's [Ayala Water & Ecology](#) for the past 26 years.

Ayala's phytoremediation systems are built into the landscaping at hundreds of industrial, residential, agricultural and recreational sites in Israel, India, Chile, Mexico, France, Germany, Greece, Singapore, the United States and Canada, with future projects planned for the Philippines and the United Kingdom.

[Abigail Klein Leichman](#)



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Now this green, sustainable solution is hotter than ever, as evidenced by the enthusiasm generated by Ayala's display at the recent [WATEC Expo](#) in Tel Aviv.

CEO and founder Eli Cohen tells ISRAEL21c that many of the visitors seeking information on using plants to clean water came from California, where a severe drought has spurred intense interest in Israeli [water technologies](#).



Ayala Water & Ecology CEO Eli Cohen among his plants at Moshav Tzipori. Photo: courtesy

The Haifa native explains that he left a high-tech career in 1988 and bought farmland in Moshav Tzipori in the central Galilee to raise and export organic aquatic plants as ornaments and natural filters for marine aquariums.

Cohen soon realized he could offer a technology- and energy-free way to create a balanced water-purifying ecosystem that needs no maintenance aside from pruning as with any garden.

“We call it ‘active landscaping.’ You can treat your own sewage in the park or garden and use the purified water to irrigate,” says Cohen. “You can produce high-quality water from nature if you create the right environment of plants, gravel and soil, and special natural additives for specific problems such as heavy metals and radioactive elements. If you do it in a natural way, it can last forever.”

Ayala's Natural Biological System (NBS) is used for a large range of phytoremediation projects, from acid mine drainage in Chile to garbage leachate in Israel's Hiriya landfill to urban sewage in India. The company's approach is so popular in India that Cohen's business partner established a subsidiary, Ayala Biological Systems, in Bangalore.



Before (left) and after water samples from an Ayala phytoremediation site in Hyderabad, India. Photo: courtesy

The NBS is a closed-loop system, using only water that is already on-site through runoff, waste or rain, and all of this water can be used for irrigating crops or ornamental plantings after going through the purification process.

Cohen says Ayala always tries to incorporate indigenous aquatic plants wherever the system is installed. “That’s part of our ideology,” he tells ISRAEL21c.



An Ayala wetlands installation protects the water of the Campeche Municipal Canal in Mexico. Photo: courtesy

Following a survey to ascertain the site's unique conditions, each system is tailor-made of modular treatment compartments sewn into the natural topography to minimize energy requirements. In keeping with local water regulations, the plant-based systems can be customized to treat grease, detergents, emulsions, high salinity, hydrocarbons, raw sewage, pharmaceutical residues, and toxic runoff from dairy farms, chicken coops, slaughterhouses and olive presses.

In Israel, NBS plantings are central to the rehabilitation of the [Yarkon](#) and Yavne rivers, and can be found also at many other sites.

Ecology-minded Kibbutz Neot Semadar in the southern Arava uses Ayala systems in its irrigation reservoir, organic fish farm and sewage treatment facility. Dor Alon and Delek gas stations use it to treat runoff, sewage and rinse water, and Ahava Cosmetics relies on Ayala to purify runoff from its cosmetics factory and sewage wastewater from its restrooms.



The plants in this Ayala pond treat runoff from the petroleum facility at Kiryat Haim, Israel. Photo: courtesy

Ayala employs seven people fulltime in Israel and hires local contractors to design and install the systems around the world.

Cohen is confident that after 26 years in the business his crew can scale up to keep pace with increased interest across the globe.

“People realize the conventional approach is too expensive and too complicated to maintain, and they are searching for a natural solution – so we’re in the right place at the right time,” says Cohen. “It took years to establish the concept and now we are ready to meet the growing demand.”

For more information, click [here](#).



Ayala installations outside the Ahava cosmetics factory at the Dead Sea. Photo: courtesy
