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By Orlando Milesi - IPS / Globetrotter

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## ***Treated Wastewater Is a Growing Source of Irrigation in Chile's Arid North***

**Credit Line:** from the [Inter Press Service](#) / [Globetrotter News Service](#)

**Note to Editors:** This is a selection of news wire reports that have been edited to be relevant for audiences for the next two weeks. You are welcome to select and publish individual items or the whole stack.

The reuse of treated wastewater in vulnerable rural areas of Chile's arid north is emerging as a new resource for the inhabitants of this long, narrow South American country.

The Coquimbo region, just south of the Atacama Desert, one of the driest in the world, is suffering from a severe drought that has lasted 15 years.

According to data from the [Meteorological Directorate](#), a regional station located in the Andes Mountains measured 30.3 millimeters (mm) of rain per square meter in 2023 as of September 10, compared to 213 mm in all of 2022.

At another station, in the coastal area, during the same period in 2023, rainfall stood at 10.5 mm compared to the usual level of 83.2 mm.

Faced with this persistent level of drought, vulnerable rural localities in Coquimbo, mostly dedicated to small-scale agriculture, are emerging as a new example of solutions that can be replicated in the country to alleviate water shortages.

The aim is to not waste the water that runs down the drains but to accumulate it in tanks, treat it, and then use it to irrigate everything from alfalfa fields to native plants and trees in parks and streets in the localities involved. It is a response to drought and the expansion of the desert.

“We were able to implement five wastewater treatment projects and reuse 9.5 liters-per-second, which is, according to a comparative value, the consumption of 2,700 people for a year or the water used to irrigate 60 hectares of olive trees,” said Gerardo Díaz, sustainability manager of the non-governmental [Fundación Chile](#).

These five projects, promoted by the Fundación Chile as part of its Water Scenarios 2030 initiative, are financed by the regional government of Coquimbo, which contributed the equivalent of \$312,000. Of this total, 73 percent is dedicated to enabling reuse systems, for which plants in need of upgrading but not reconstruction have been selected.

The common objective of these projects, which together benefit some 6,500 people, is the reuse of wastewater for productive purposes, the replacement of drinking water, or the recharge of aquifers.

Díaz told IPS that the amount of reuse obtained is significant because previously this water was discharged into a stream, canal, or river where it was perhaps captured downstream.

### **A Successful Pilot Experience**

In Coquimbo, which has a regional population of some 780,000 people, there are 71 water treatment plants, most of which use activated sludge and almost all of which are linked to the Rural Drinking Water Program (APR) of the state [Hydraulic Works Directorate](#).

Activated sludge systems are biological wastewater treatment processes using microorganisms, which are very sensitive in their operation and maintenance and rural sectors do not have the capacity to maintain them.

“Most of these treatment plants are not operating or are operating inefficiently,” Díaz acknowledged.

But one of the plants, once reconditioned, has served as a model for others since 2018. Its creation allowed Dionisio Antiquera, a 52-year-old agricultural technician, to save his alfalfa crop.

“We have had a water deficit for years. This recycled water really helps us grow our crops on our eight hectares of land,” he said in the middle of his alfalfa field in Cerrillos de Tamaya, one of the Coquimbo municipalities that IPS toured for several days to observe five wastewater reuse projects.

He explained that using just reused water he was able to produce six normal alfalfa harvests per year with a yield per hectare of 100 25-kg bales.

“That’s 4,500 to 4,800 bales in the annual production season,” he said proudly.

These bales are easily sold in the region because they are cheaper than those of other farmers.

The water he uses comes from an APR plant that has 1,065 users, 650 of whom provide water, including Antiquera.

On one side of his alfalfa field is a plant that accumulates the sludge that is dehydrated in pools and drying courts, and on the other side, the water is chlorinated and runs into another pond in its natural state.

“This water works well for alfalfa. It is hard water that has about 1,400 parts per million of salt. Then it goes through a reverse osmosis process that removes the salt and the water is suitable for human consumption,” the farmer explained.

In Chile, treated wastewater is not considered freshwater or water that can be used directly by people, and its reuse is only indirect.

Antiquera sold half a hectare to the government to install the plant and in exchange uses the water obtained and contributes 20 percent to the local APR.

He recently extended his alfalfa field to another seven hectares, thanks to his success with treated water.

### **Flowers and Trees Also Benefit**

In Villa Puclaro, in the Coquimbo municipality of Vicuña, Raúl Ángel Flores, 55, has an ornamental plant nursery.

“I’ve done really well. My nursery has grown with just [reused water]... I have more than 40,000 ornamental, fruit, native, and cactus plants. I deliver to retailers in Vicuña and Coquimbo,” a port city in the region, he told IPS.

The nursery is 850 square meters in size and has an accumulation pond and pumps to pump the water. He has now rented a 2,500-meter plot of land to expand it.

Flores explained to IPS that he manages the nursery together with his wife, Carolina Cáceres, and despite the fact that they have two daughters and a senior citizen in their care, “We make a living just selling the plants... I even hired an assistant,” he added.

In the southern hemisphere summer, he uses between 4,000 and 5,000 liters of water a day for irrigation.

“I have water to spare. Here it could be reused for anything,” he said.

Joining the project made it possible for Flores to make efficient use of water with a business model that in this case incorporates a fee for the water to the plant management, which is equivalent to 62 cents per cubic meter used.

## **Eliminating Odors, and Creating New Gardens**

In the community of Huatulame, in the municipality of Monte Patria, Fundación Chile built an artificial surface wetland to put an end to the bad odors caused by effluents from a deficient waste-eater earthworm vermifilter treatment plant.

“This wetland has brought us peace because the odors have been eliminated. For the past year people have been able to walk along the banks of the old riverbed,” Deysy Cortés, 72, president of the APR, told IPS.

The municipality of Monte Patria is financing the repair of the plant with the equivalent of \$100,000.

“The sprinklers will be changed, the filtering system will be replaced, and sawdust and worms will be added. It will be up and running in a couple of months,” explained agronomist Jorge Núñez, a consultant for Fundación Chile.

As in other renovated plants, safe infiltration of wastewater is ensured while the project simultaneously promotes the protection of nearby wells to provide water to the villagers.

Cortés warned of serious difficulties if no more rain falls in the rest of 2023, despite the relief provided by the plant for irrigation.

“I foresee a very difficult future if it doesn’t rain. We will go back to what we experienced in 2019 when in every house there were bottles filled with water and a little jug to bathe once a week,” she said.

During a recent crisis, the local APR paid \$2,500 to bring in water from four 20,000-liter tanker trucks.

In Plan de Hornos, a town in the municipality of Illapel, irrigation technology was installed using reused water instead of drinking water to create a green space for the community to enjoy.

The project included water taps in people’s homes for residents to water trees and flowers. Arnoldo Olivares, 59, is in charge of the plant, which has 160 members.

“I run both systems,” he told IPS. “I pour drinking water into the pond. After passing through the houses, the water goes into the drainage system, where there is a procedure to reclaim and treat it.”

“This water was lost before, and now we reuse it to irrigate the saplings. We used to work manually, [but] now it is automated. It’s a tremendous change, we’re really happy,” he said.

Antiquera the alfalfa farmer is happy with his success in Cerrillos de Tamaya, but warns that in his area 150 to 160 mm of rainfall per year is normal and so far only 25 mm have fallen in 2023.

“The water crisis forces us to find alternatives and to be 100 percent efficient. Not a drop of water can be wasted. They have forecast very high temperatures for the upcoming (southern hemisphere) summer, which means that plants will require more water in order to thrive,” he said.

Díaz, the sustainability manager of Fundación Chile, said the Coquimbo projects are fully replicable in other water-stressed areas of Chile if a collaborative model is used.

He noted that “in Chile, there is no law for the reuse of treated wastewater. There is only a gray water law that was passed years ago, but there are no regulations to implement it.”

He explained, however, that due to the drought, “rural localities today are already reusing wastewater or gray water. This is going to happen, with or without us, with or without a law. The need for water is so great that the communities are accepting the use of treated wastewater.”

The governor of Coquimbo, Krist Naranjo, argued that “a broader vision is needed to value water resources that are essential for life, especially in the context of global climate change.”

“We’re working on different initiatives with different executors, but the essential thing is to value the reuse of [grey water] recycling,” she told IPS from La Serena, the regional capital.