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## Israelis find environmentally friendly fish farming system

By GALI WEINREB/GLOBES  
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“Our system is a closed system that prevents contaminating the outside, creating a complete solution to the problem of pollution from fish waste.”

Let's assume that you live in the Jerusalem hills or in arid Las Vegas and you want to found a business to grow sea fish for food. Once upon a time, you would have had to migrate to the coast or lakeshore. Now it is possible to raise fish in the middle of the desert – even without a well for water – with plastic pools like the ones in the backyard that children play in.

Yaron Gissin, formerly a Foreign Ministry official responsible for technology and later an IT entrepreneur, founded GFA Advanced Systems Ltd. (Grow Fish Anywhere) as an interesting idea for a start-up. With several partners, he visited the Hebrew University in Jerusalem's Faculty of Agriculture, where Prof. Yap Van Rein showed them the technology he invented.

“We were first asked what we had to do with fish,” Gissin, adding that he and his colleagues persevered, dived into the world of aquaculture and seem to be swimming in it quite well.

“We had heard about the collapse of fish stocks and the pollution caused by the fish cages at Eilat,” Gissin told Globes. “We knew that pollution was the number one problem for fish farmers.

“At the university, we saw a project that verged on science fiction. Although there were only two fish tanks of five cubic meters each, we could see that this was a pollution-free system with full environmental controls. The challenge was to expand production to an industrial scale.”

The two main pollutants that most trouble fish farmers (and their coral-reef neighbors) are industrial waste and fish feces, both of which damage marine ecologies.

“Our system is a closed system that prevents contaminating the outside, creating a complete solution to the problem of pollution from fish waste,” GFA CEO Dotan Bar-Noi told Globes.

The company's fish tanks are made from ordinary plastic, and the water is ordinary tap water with salt added, he said. The sophistication is in the system to clean the water of fish feces.

“This task is carried out by biofilters, purifiers made from specialized bacteria that break down the nitrogen

and carbon compounds in fish waste and convert it into carbon dioxide and gaseous nitrogen, which are discharged harmlessly into the atmosphere,” Bar-Noi said. “The bacteria work round the clock, do not need electricity and are so efficient that there is no need to replace the water in the fish tanks.”

“The switch from ordinary purification systems was not easy,” Van Rein said, “because the water entering the system is completely different, as is the water leaving it.”

The system can raise fish more quickly because its environmental system fully controls the minerals in the water and its temperature.

“Wild fish stocks are falling, and our product can raise fish almost anywhere, with high economic viability and without pollution,” Bar-Noi said.

GFA raised more than \$6 million in 2008. It used the proceeds to build a semi-commercial pilot in Israel, which sells fish to the local market as part of the company’s plan to accumulate real market experience.

“The response to the fish was good,” Gissin said. “They are the same as produce from the sea, except that there is no fear of contamination.”

In early 2009, GFA set up a commercial project in upstate New York, which raises bream and markets it locally.

“The system can be adapted to any species of fish by controlling the temperature, acidity and salinity,” Bar-Noi said.

Van Rein said he was worried by the current condition of wild fish stocks.

“There are only 90 million tons of fish in all the world’s oceans and lakes, and whole species face extinction,” he said.

Gissin said there was no cruelty to fish in raising them in small ponds rather than in the open sea.

“We keep their density at ordinary levels, since the fish swim in schools,” he said. “As for waste, fish don’t like swimming in it, as happens in current fish farms. As we understand it, the fish are actually happier in the new conditions.”

In October, GFA raised more than NIS 18m. from a Dutch fund that specializes in marine ventures.

“This investment was a vote of confidence in the technology and in the team,” Bar-Noi said. “We will use the proceeds to set up full fish farms using the company’s method. We hope that, in future, an evergrowing proportion of fish will be raised with our systems, which do not harm the environment and provide fresh fish close to consumers.”

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