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A Fish Story

By Stewart Ain
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The overfishing of the oceans and the near annihilation of some species, such as the Atlantic bluefin tuna, are a hot topic these days. A number of books have plied these sad waters of late, from Dean Bavington's "Managed Annihilation: An Unnatural History of the Newfoundland Cod Collapse" (University of British Columbia) to Paul Greenberg's salmon-centered tale, "Four Fish: The Future of the Last Wild Food" (Penguin Press).
But a Hebrew University aquaculture researcher has a potential way out of the problem of the world's shrinking fish supply. He has developed a way to grow fresh or seawater fish in inland ponds, and he is now watching his work become commercially viable in upstate New York.

Jaap van Rijn, a member of the school's faculty of Agricultural, Food and Environmental Quality Sciences, drove last month to Hudson in Columbia County to see the 800 cubic meters — 800,000 liters — of fish tanks set up in a converted warehouse. Using his method, the fish hatchery is able to increase fish output to a density that is 50 to 100 times greater than conventional ponds.

Hebrew University's Jaap van Rijn: Growing fish in inland ponds.
MICHAEL DATIKASH

In an interview during a visit here, van Rijn said the need for more fish to help combat world hunger and meet the world's growing appetite for fish comes at a time when various countries have imposed bans on saltwater fish hatcheries in the ocean because of environmental concerns. They have also imposed quotas on catching various species of fish because their stocks have fallen below the level at which they can naturally reproduce.

As a result, the aquaculture industry has become of increasing importance to satisfy market needs. Studies show, for instance, that whereas farmed salmon represented less than 10 percent of the global catch 20 years ago, it now represents 60 percent of the salmon market. During this period, the wild salmon catch has stagnated and growth has come only through farmed salmon, which reached a volume of about 1.5 million tons. A similar situation has occurred with sea bass and sea bream.

But a 2006 study from the Food and Agriculture Organization of the United Nations said that by 2030 an additional 40 million tons of fish would be needed just to maintain current levels of fish consumption.

That would not have been possible without a change in the way fish are grown because fisheries in the last 30 years have been stable, van Rijn said, growing 90 million metric tons of fish even as more and more species of fish are becoming extinct, such as blue fin tuna.

He explained that the reason is because fish are grown in regular earthen bottom fishponds, which limit the number of fish that can be grown per volume of water. Increasing the volume of fish was impossible because of fish excretions that polluted the water.

To overcome that problem, van Rijn began his experiments in 1986 by cleaning the tank water through chemical and biological means before re-circulating it in fishponds with plastic or concrete-lined basins. He said he found he could thereby increase fish density by 50 to 100 times conventional ponds.

But because 10 to 20 percent of the polluted fishpond water was lost during this process, it ended up "polluting the environment because it was often not treated." To rectify the problem, van Rijn said he adapted the idea of a wastewater treatment plant — adding mechanical and bacterial filtration that "converted all of the pollutant from fish excretions into harmless gases."

The fish being grown in upstate New York are sea bream, also known as orata fish. That venture began after Hebrew University in 2006 sublicensed van Rijn's technology to a company called Grow Fish Anywhere. Based on the results of a one-year test in Israel, a group of investors in New York set up the commercial plant in Hudson a year ago to produce close to 100 tons of sea bream.

Although it normally takes nine to 12 months to grow sea bream, van Rijn said but the first sea bream were ready after only seven months and were sold at restaurants in Albany and the Hudson area.

They may be sold in neighborhood supermarkets in the next year or two because the owners of the Hudson facility are planning to expand to Florida and California.
"By the end of the year, they will have invested $50 million in these three sites," he said.