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Why Investors Should Chase Eel Aquaculture

To say that new money has been flooding into land-based aquaculture recently would be an understatement. In a 2019 study on land-based initiatives, Rabobank estimated that new production reared from Recirculating Aquaculture Systems (RAS) would add over 700,000 metric tonnes (MT) per year. Most of this investment is for Atlantic salmon.

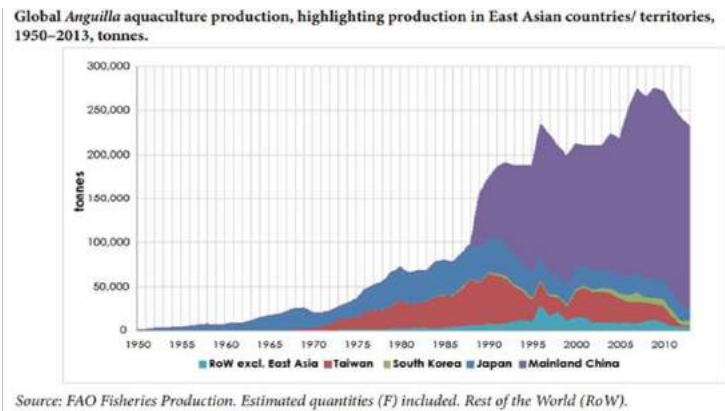
But with 10-year average prices of more than \$35 per kilogram for farmgate eel, 5x the price of Atlantic salmon, the most industrialized fish, one would think that investors would be falling all over themselves to support more eel aquaculture. Instead, pickings for new eel investment opportunities are slim. There is, of course, American Unagi based in Maine and set to produce 230 MT and China's new Bilund¹ facility, which is still on the drawing board. But new options are limited from there.

So why hasn't freshwater eel, with the longest history of land cultivation of any fish species, received more attention?

THE DYNAMICS OF THE EEL MARKET

Eels are a delicacy in Asia and in parts of Western Europe; farming exploded in the late '80s to meet the demand from these areas, as shown in Figure 1 from the United Nations' Food and Agriculture Organization (FAO).

Figure 1



In East Asia, it is Japan and China that dominate the eel market. The Japanese eat eel prepared as Kabayaki or Unakyu (Sushi). Both versions are prepared as fillets with soy-based sauce and grilled. According to a report by Traffic, a strategic alliance between the WWF and the IUCN², in the early 2000s, Japan annually consumed ~150,000 MT of eel. But its consumption has fallen in recent years to ~35,000 MT, and the Chinese have filled the gap, consuming ~150,000 MT in 2012 and 2013.

With respect to eel, the Japanese have a love-hate relationship with Chinese production. While the Chinese are by far the largest producers of eel in the world, its production methods are considered poor and its eel husbandry often results in a chemical-ridden and, therefore, less appealing product.

In China, eel is cultivated mainly in earthen ponds where limited water and air circulation often requires farmers to use excessive antibiotics to promote fish health. As a result, the discerning Japanese seafood consumer with a high discretionary income has shunned most Chinese production. These buyers continue to look for a sustainable, healthier eel product.

Both Holland and Germany have a strong culture of eating smoked eel so it should not be a surprise that the Netherlands and Germany rank the highest on the league table of European producers, as per metrics released by the Federation of European Aquaculture Producers (FEAP).

FEAP 2019 production data
(in metric tonnes)

Netherlands	2,150
Germany	1,207
Italy	750
Spain	360
Poland	11
Total	4,478

Unlike in China, most of this region's eel production is through RAS facilities and is considered healthier for consumers. Of course, as many aquaculture investors now recognize, RAS production allows control over the value chain, water quality, and production inputs in a way not available in an open environment such as earthen ponds. This becomes a necessity in delivering the absolute best product to consumers.

EEL FARMING IN RECIRCULATING AQUACULTURE SYSTEMS (RAS)

RAS-based eel farming is in many ways simpler than comparable finfish aquaculture. Eel is a catadromous species meaning that it begins life in the ocean, migrates to freshwater areas like rivers or streams for much of its adult life before returning to the ocean to spawn.

Eel is typically harvested at 150 to 250 grams, and in a RAS facility, reared in a freshwater environment. Unlike marine finfish raised on land, a farmer does not need to be concerned with varying levels of salinity, an area of land-based farming that can easily kill juveniles.

Additionally, eels are hardier than other finfish, so mortality levels are lower. Throw a few eels in a bucket in the baking sun with no food or new water; they can remain alive far longer than most finfish.

At a RAS farm, this “hardiness” translates into higher density stocking levels, reducing the amount of Capex, and lower mortality levels across production increasing profitability.

The key challenge, however, no matter the cultivation method, is the supply of juveniles or glass eels. Glass eels make their way from the Sargasso Sea in the Atlantic Ocean to freshwater systems in Europe and North America to grow into adulthood.

Glass eels derive their name from their glass-like or translucent appearance upon birth.



Source: Wikipedia

However, beyond the regions that eels populate and an understanding of their life cycles, scientists know little about their spawning activity. This lack of understanding has resulted in limited success in replicating spawning in captivity, leaving land-based cultivation in need of a wild glass eel supply.

THE HIGH PRICE OF EELS

The great demand for eels in Asia and the growing demand elsewhere has landed some wild freshwater eel species on endangered species lists. It has also ignited worldwide eel trafficking, driven by the extended high prices. In Europe, CITES³ has placed European Eel (*Anguilla anguilla*) on its Appendix II, effectively preventing international trade. Asian Eel (*Anguilla japonica*) and American Eel (*Anguilla rostrata*) have been listed on the IUCN Red list, highlighting the need for sustainable sourcing policies.

Meanwhile, at Canadian and US eel fisheries, where international trade is still open, prices for eels have soared, particularly for glass eels. So much so that a significant black market for smuggling glass eels⁴ has

evolved with juveniles fetching as much as \$4,000 per kilogram.

In 2014, a consortium of law enforcement agencies led by the U.S. Fish and Wildlife Office of Law Enforcement, conducted a sting operation called Operation Broken Glass to stop elver poaching and trafficking.

But, globally, eel trafficking goes on.

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Europol just completed its fourth anti-trafficking operation in April 2020 resulting in the arrest of 108 elver smugglers and the seizure of EUR 6.2m (USD 5.5m) worth of smuggled elvers⁵. With eel demand sustained and no long-term solution in sight, this trafficking is likely to continue, putting more pressure on the world’s remaining wild stock.

That said, the economics of eel aquaculture can absorb the high cost of glass eels because there are 3000 to 6000 juveniles per kilogram, giving farmers a lot of room to maneuver.

CALLING FOR AQUACULTURALISTS

The eel market is ripe for disruption and sustainable investment.

As is the case for other wild caught fish species facing overconsumption, aquaculture is the answer to alleviating pressure on the wild eel population. Private farmers can meet the worldwide demand for eel and contribute to critical conservation practices like restocking. This species’ vibrant Japanese and European consumer markets and the fast-paced growth of the US market makes it particularly interesting for RAS investment. With discerning consumers and stringent regulations, growing eel in a controlled environment, where water is consistently cleaned and filtered, limiting the need for antibiotics, is an easy choice.

The US itself would be an attractive place for an eel producer. A “Made in America” stamp would carry

weight with the heavily regulated European market and engender trust with the discerning Japanese buyer. Cheap land and electricity, high quality water and an efficient transportation infrastructure also provides fertile ground for RAS investment. High-end Japanese-style restaurants would create premium demand for a US farmed eel, regardless of adoption rates by mainstream America.

Additionally, RAS-produced eel, when compared to a marine finfish like Atlantic salmon, has lower investment costs per kilogram and higher profitability. It is the net result of being able to stock eel in higher densities, not requiring salinization equipment, and the species' general resilience compared to RAS produced marine finfish.

Despite these obvious strengths, the mystery of why more aquaculturists and sustainability-focused investors don't pursue eel aquaculture may remain as elusive as the spawning habits of eels in the Sargasso Sea. But at least scientists are making inroads on the latter (there have been some successful studies demonstrating glass eel cultivation in captivity).

But we expect sky high eel prices to persist and seafood production through RAS to continue seeing investor interest so we believe that the tide will turn for the eel. There has certainly been no shortage of capital looking for a home, and land-based investment initiatives have seen the most activity in years.

Eel aquaculture, with its attractive economics and sustainability focus, could be the right place for some of the money that has recently come flooding into the sector.

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