



Russian Economics of Trout and Salmon Aquaculture

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While Russian aquaculture has a large untapped potential it still accounts for less than 5% of the total country's fish production, comparing to more than 50% at the world level.

While growth is expected in all areas of Russian aquaculture, the greatest growth is possible in the area of salmon species. Consumption in Russia is high and is supplied mainly by imports. The country produces less than 50% of all consumed salmonids. There is also a great potential for further growth in consumption as the rising standard of living in the country makes fish consumption more affordable. In the B2B segment, the consumer is driven by retail and HORECA, which require chilled raw fish for further processing and sales.

There are two basic salmonid farming methods in Russia:

- In cages (salmon in the Barents Sea, and trout in fresh lakes in the North-West of the country),
- In a recirculating aquaculture system (RAS), which can be built near the consumer.

A cage farm focuses on species cultivation based on the climate zone or natural environment at farm's location. Unlike cage farms, RAS cultivates a wide variety of commercial aquaculture species provided the breed is available and sales market opportunities exist.

Brief comparison of the two farming methods is provided below

RAS:

Capital expenditure (CAPEX) for a farm with the shortest payback period, producing 1000 tons of fish is \$16 million. The

annual revenue is \$7 million. The EBIT margin is 35-45%, and the payback period is 4-6 years.

Cage aquaculture:

The CAPEX for a 1000-ton farm is \$2.5 million. While coastal service infrastructure expenses are not needed for RAS, in the Cage aquaculture case to ensure profitability these expenses limit farm production to over 5000 tons.

Another difference between RAS and Cage aquaculture is that cage fish growing to a market size takes twice as long. This, in turn, implies less revenue generated by cage aquaculture. Annual revenue is \$3.5 million per farm can be achieved only by several farms. A single cage farm revenue is received once every few years, depending on the growth cycle. EBIT margin is 30%, and the payback period is 3-4 years.

It should be noted that RAS has numerous additional advantages over cage aquaculture despite the latter's low capital intensity. Those include:

- Generation of optimal conditions to maximize fish growth (such as water temperature control, oxygen regulation, feed.
- Monitoring fish disease.
- Lower feed conversion ratio - no more than 1.3x per cycle.
- Full growth cycle - 17-27 months, which is 1.5-2 times shorter than the cage aquaculture full growth cycle.
- Saving water, land, and energy resources.
- Fewer regulations and permits are required, similar to a typical construction project.

If technologies are followed, aquaculture allows achieving

high operating profitability after the start of sales. Modern farms are characterized by a high level of automation; hence production requires a small number of personnel.

Low level of competency in Russian aquaculture and under-assessment of risks are the main problems of aquaculture farming in Russia. These problems delay development of the industry.

Main risks could be divided into four groups:

Technological risks:

- Russian technologies are absent or of insufficient quality.
- Foreign technologies are expensive, and often not fully implemented.
- All technologies require regional adaptation.

Biosecurity risks:

- The current lack of foolproof protection allows the entry of

dirt and infections.

- Lack of control over the fish breed and feed.
- Lack of prevention practice to control the biosecurity on the farms.

Financing risks:

- Under assessment of the working capital needed for the long - term fish growing cycle.
- Lower level of government support for the sector as compared to other agriculture sectors.
- New investors can hardly obtain loan financing with the need to provide recourse to the banks.

Personnel drawbacks:

- At the current time only few university programs prepare students for aquaculture business.
- Lack of relevant internship programs in this sector.
- The profession is not prestigious, the college selection criteria is low and acceptance rate is high.

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