AIMS Commentary
Atlantic Institute for Market Studies

Perspectives, Perceptions and Priorities

An Economist's view on the Aquaculture industry

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I am a macro economist. I say that without apology! It does mean that I don't have the depth of business experience of aquaculture that many of you have developed through actual engagement in managing operations, dealing with crises, deflecting criticisms and developing markets for your products. It also means that I can't profess a thorough knowledge of the constraints represented by scientific uncertainty, climactic variability and consumer capriciousness that determine the commercial viability of the industry or of individual operations.

What economics does provide me with, however, is a framework within which to place in context the scale of the aquaculture industry world-wide—and locally—as well as a method for assessing the benefits of competing uses for the resources your industry needs in order to develop—such as labour, land/space, development capital etc.

I have called this talk: Perspectives, Perceptions and Priorities. Under the heading of perspectives I would like to provide a sense of the dramatic changes that have characterized your industry—along with the incredible, perhaps also unstoppable, growth in the contribution of aquaculture to the protein and other requirements of people.

On the issue of perceptions I would like to recognize some of the public awareness challenges—but will talk much more about the opportunities for positive image development.

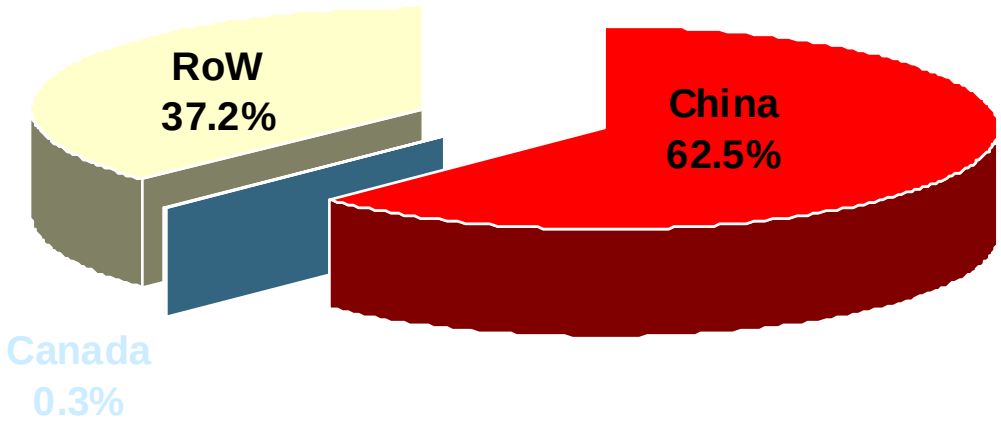
Finally, I would like to talk about priorities—how we can develop policies that will help address competing demands for the building blocks of your industry in a means that fully serves the myriad and changing needs of the Nova Scotia economy.

As engaged industry participants you are likely familiar with the statistics detailing the explosive advances in aquaculture that industry associations like your own frequently quote. But it doesn't hurt to repeat some of the more spectacular figures—with extra emphasis. Worldwide production is currently valued in excess of $100 billion US. If you need some perspective on that number, consider that it is roughly in the same order as the entire gross domestic product of a small developed country such as New Zealand.

We know too, that according to the United Nations Food and Agriculture Organization (FAO), that in the period 1970–2008, the production of food fish from aquaculture increased at an average annual growth rate of 8.3 percent, while the world population grew at an average of 1.6 percent per year. From a humanitarian perspective, the combined outcome of both those measures is that the average annual per capita supply of food fish from aquaculture for human consumption has increased by ten times, from 0.7 kg in 1970 to 7.8 kg in 2008, at an average rate of 6.6 percent per year. The corresponding estimated amount in 2009 is 8.1 kg, and for 2010 the forecast amount is 8.3 kg.

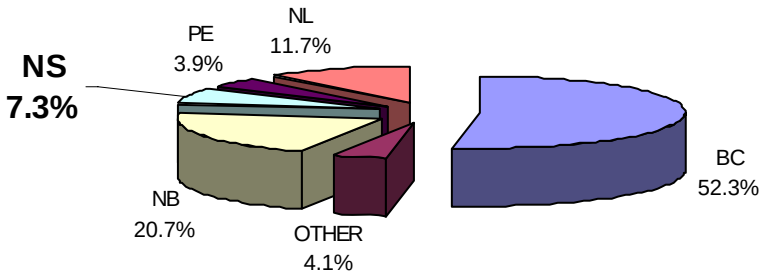
If not already a reality, "farmed" product will within a year or so exceed fifty percent of global consumption of food fish.

Not surprisingly, those countries with the greatest population pressures and the least available protein supply have been at the forefront of the aquaculture revolution—at a pace that has totally eclipsed Canadian experience. In China more than 80 percent of food fish consumption is produced by aquaculture. That country alone accounts for 62.5 percent of world aquaculture output. Other countries with production of more than 1 million tons each are: India, Viet Nam, Indonesia, Thailand and Bangladesh. Rounding out the top 10 global producers are Norway, Chile, Japan and Myanmar.



So where in this vast reality of explosive development does Canada stand? Overall, Canada ranks 23rd among world aquaculture producers, and contributes less than 0.3 per cent of total global output. At present only about 14 percent of total fisheries production in this country is generated by aquaculture—but as much as 35 percent of its value.

However, Canada possesses roughly 25 percent of the world's coastline and about 16 percent of global fresh water. Moreover, unlike large swathes of the US coastline, our coasts are significantly less constrained by existing alternative uses/development. There are other factors at play—such considerations as cold temperatures, consumer resistance and the competing interests of caught-species fishers. At this juncture my credentials as a macroeconomist limit my qualifications to offer an explanation of precisely why Canada is such an industry laggard. Still, a visiting alien might be puzzled by the seeming underdevelopment of such an abundant resource apparently primed for exploitation.



If the underemployment of the rich potential of Canada's long coastline is baffling how much greater is the conundrum characterized by circumstances in Nova Scotia. The province not only has an extensive coastline—but also one of the more varied: represented by quite different conditions along the Fundy and Atlantic shores as well as the quite dissimilar waters around Cape Breton and the Bras d'Or Lakes. Yet Nova Scotia represents 7.3 percent of the country's production—dramatically below the 21 percent contribution of New Brunswick. British Columbia accounts for 52 percent of Canada's aquaculture production.

Again, given the complexity that still surrounds the science and regulation of aquaculture operations it is not the place of the economist to opine on why this is so—but is entirely appropriate to consider how valuable it would be for Nova Scotia were the industry to make a greater contribution to the economy. I'll return to that observation later.

Where an economist can offer some perspective, it might be to suggest that "revolutions" typically carry forward with accelerating momentum. We haven't yet experienced the dénouement of the industrial revolution. The computer/IT/Internet revolution gathers impetus on a continuous basis. The explosive expansion of disciplined cultivation of ocean and fresh water resources shows no signs of moderating. The protein requirements of an increasingly wealthy cadre of previously underdeveloped countries like China and India, along with the decline in "capture" stocks in regions such as Canada's Atlantic coast seem destined to ensure that tomorrow's industry will totally eclipse the tiny footprint evident today. The resources represented by Canada's huge coast may turn out to be an exceptional advantage. So they should be.

While we are on the subject of unbounded potential, I would like to throw in the sometimes overlooked possibilities represented by aquatic plants. Global production of around 18 million tons is a niche almost totally harvested from cultivated beds representing a $4.2 billion US market. The species represent a vast array of value added arising from applications as food additives, bio-pharmaceutical products as well as fish and animal feed. Perhaps their greatest value may be manifest in the huge number of experimental energy conversion projects aimed at producing bioenergy alternatives for conventional fossil fuels.

With such a broad array of potential high-value output from such an underutilized resource—the world's oceans—it appears inevitable that there will be conflicts between alternative applications and between competing developers. While today concerns are typically limited to such micro issues as the allocation of rights along a few thousand metres of coastline it is entirely conceivable that future disputes will require much wider coordination and most likely international agreement. Unlike land-based agriculture, marine "fields" have a tendency to

"move" of their own volition—replenishing consumed nutrients, but also broadcasting waste by-products such as excrements, and excess stimulants and pesticides. To use the language of economics, the scope for externalities—both negative and positive—is immense.

Economists have long been familiar with the concept known as "The Tragedy of the Commons"—a phenomenon dating back to medieval farm exploitation. Where grazing land was held "in-common" and cattle were allowed to forage without constraint each farmer had an incentive to exploit the land to excess, without regard to the eventual deterioration of the resource.

Perhaps a more pertinent example is the collapse of the northern cod fishery that happened despite persistent reports of dwindling stocks.

I was recently reminded that the entire salmon cage footprint of Nova Scotia could be accommodated in a small portion of the Bedford Basin. Surely there is ample room for competing interests for marine resources without developing expensive and protracted regulatory procedures that are most prejudicial to smaller operators. I believe that is true—but if the massive potential that I have sketched for global aquaculture is in any measure correct then we must be prepared to ensure that sensible and negotiable measures are instituted that will protect the security of interested parties—while ensuring the viability of an industry that could prove one of the economic-saviours of Nova Scotia.

That provides me with a convenient bridge to the "Perceptions" part of my talk. You will probably agree with me that the aquaculture industry is the victim of a substantial degree of misunderstanding—even ignorance. The learning curve of industry development has generated examples of inappropriate or excessive utilization of additives, pesticides and colourants as well as poorly managed containment of stock and by-product and inappropriate stock concentrations. Such practices have occurred and have contributed negatively on the industry's image—and some will add, have enabled those with competing interests to exploit the circumstances. I do not wish to focus on that representation of the industry—other than to emphasize that if my vision of a hugely expanded global development of marine resource utilization is accurate then the establishment of efficient and equitable practices will be essential. That outcome requires a far greater understanding of the science than is presently available as well as the development of effective means of resolving competing interests—between local concerns as well as among international partners.

With respect to image, what I would like to focus on are the opportunities for superior product development and enhanced representation. I have heard from some within the Nova Scotia industry that they are essentially price takers—subject to intense price competition in US markets from larger fin fish producers like Chile. Even in the local mussel market it can be argued that the big winners are local consumers reaping a price bonus.

Twenty-five years ago New Zealand was one of the world's most important producers of lamb and mutton—it still is. Back then, however, about 40 percent of farmer's income was derived directly from government support—and the country was in financial crisis. In 1984 subsidies were eliminated and the industry went into crisis mode. Massive stock reductions were undertaken. With government assistance the industry began to rebuild with a focus on quality. Improved pasturing was undertaken, carcass weights began to rise and product image began to be associated with quality. Today, country-of-origin-branded New Zealand lamb is world renowned—fully competitive with price-supported meat in their export markets.

Production levels have recovered—without subsidization. Is there any reason that Nova Scotian farmed products can't carve out a similar niche market?

Perhaps Scottish salmon provides a further example. One of the more cherished Scottish icons is the wild salmon. It is hard to imagine a more archetypical image of Scotland than a fly rod curving over a rough-running stream. Few countries have had much to lose from a tarnished image. Yet for more than four decades commercial operations have been improving operating standards and creating economic opportunity. While continuing to voice concern over some industry practices and consequences, even the Atlantic Salmon Trust—a preservation oriented charity—acknowledges that: "the salmon farming industry is a massive contributor to the economy. Using the Scottish Government's multiplier, the £36 million wage-bill translates to an input of almost £166 million to the Scottish economy, most of it in the Highlands and Islands." And that the industry is "here to stay"—even if the trust continues to promote improved practices that include a zero-tolerance to escapes.

Fish and seafood are the number one Scottish food export—dwarfing lamb and beef shipments. In the words of the Scottish Fisheries Secretary: "Thanks to our quality ingredients, clean environment and passionate producers, Scotland is developing an enviable reputation for creating first-class products."

My argument is that our province should be able to carve out a "high-profile" "high-value-added" specialty niche in aquaculture—and not remain satisfied with simply responding to market demands established elsewhere.

How we can do that and why we should do that brings me to the final part of my remarks. It's all about setting priorities. AIMS recently released a paper that I wrote entitled *"Nova Scotians Without Borders—Why economic and industrial development strategies should refocus on people rather than regions."*

I wrote the paper because I was so struck by the dramatic changes taking place in our province. The government fully understands—and the public is finally beginning to recognize that the old paradigm of persistent unemployment is becoming obsolete. Along with dwindling population numbers and increasing average ages the province is beginning to experience actual declines in the working-age population.

That might sound like great news—full employment! Of course the kicker is that those who are working will be supporting an increased proportion of the population who will be outside of the workforce—chiefly older persons with rising demands for health and social support. For Nova Scotia there is another element to the demographic picture—the rural population is in major decline. In fact, if you were to just examine the population of Halifax you might be tempted to talk of boom times. Construction cranes dot the horizon; suburban housing is sprouting everywhere. The city is growing and the newly-announced shipbuilding contracts will add to that momentum.

Nova Scotia Population Shifts

	1997	2010	Change	%Change
Nova Scotia	932,402	942,506	10,104	1.1
Counties:				
Halifax	355,523	403,437	47,914	13.5
Colchester	50,488	52,185	1,697	3.4
Hants	40,844	41,642	798	2.0
Kings	60,950	61,042	92	0.2
Antigonish	19,955	19,005	(950)	-4.8
Annapolis	22,750	21,665	(1,085)	-4.8
Victoria	8,659	7,523	(1,136)	-13.1
Richmond	11,087	9,869	(1,218)	-11.0
Queens	12,564	11,202	(1,362)	-10.8
Lunenburg	48,569	46,801	(1,768)	-3.6
Yarmouth	27,848	25,871	(1,977)	-7.1
Shelburne	17,243	14,756	(2,487)	-14.4
Guysborough	10,994	8,460	(2,534)	-23.0
Cumberland	34,500	31,908	(2,592)	-7.5
Digby	20,781	18,110	(2,671)	-12.9
Pictou	49,526	46,798	(2,728)	-5.5
Inverness	21,180	18,065	(3,115)	-14.7
Cape Breton	118,941	104,167	(14,774)	-12.4

Source: Statistics Canada

As the above chart demonstrates, the picture is very different in outlying areas. Over the past 15 years-or-so Guysborough has lost almost one-quarter of its population; Cape Breton more than 12 percent. As these regions become hollowed out, the remaining populations remain in increasing need of services that the government is increasingly hard-pressed to meet.

The Nova Scotia government has for decades recognized the regional discrepancies in economic prospects throughout the province—and the primary focus of *Nova Scotians Without Borders* was to focus on the successive failures of policies attempting to artificially create or retain jobs in a location not because it offered economic advantage but—in fact precisely because it offered economic disadvantage: i.e. an underemployed workforce for whom there were no other local opportunities.

The paper argues that industrial development strategies should put people first—ahead of geographical boundaries.

As a development strategy for Nova Scotia aquaculture is a natural. Of course it focuses on skills and knowledge of marine environments that residents have acquired over centuries. It also caters in substantial measure to entrepreneurial development—rather than to the same sorry "make work" grind of hourly paid labour in single-company towns that has characterized so many "projects" in the past. Perhaps pre-eminently it anchors new prospects squarely where they are most needed—in the de-populating rural regions. It creates new jobs where they are most urgently required. In virtually every regard aquaculture expansion as a development initiative is desirable and beneficial. Even as an incentive to immigration—to help reverse declining employment trends—it offers work to outsiders who will bring with them industry skills and knowledge from other parts of the world.

What can Nova Scotia do to encourage this activity? Well this is an opportune time for me to close out my remarks. Your Association has been steadfast in promoting your industry and I am sure that much of the remaining time in this conference will be spent identifying ways in which barriers to expansion can be dismantled and incentives created. The remedies are much more explicit than a macroeconomist can easily identify—but I know they will include measures to limit undue regulatory burdens; the equitable resolution of competing interests; sensible and supportive labour and immigration policies and provisions to promote access to funds for operational expenses as well as capital expansion.

What might resolving those issues involve? First and foremost a recognition on the part of all

government agencies that there are some real and exciting possibilities for a dramatic industrial shift. This new industry will bear hardly any resemblance to the piecemeal development that has characterized aquaculture so far. It will require squarely addressing competing demands and establishing forward-looking policies that may have to be promoted and defended with other interest groups, the public at large and even in international negotiations. The goal must be to provide the industry with clear expectations and a streamlined regulatory process that takes into account the science and true costs of potential mistakes.

Labour and immigration policies must be developed that eschew the old-fashioned and counter-productive strategies of attempting to induce industry to relocate to areas of surplus labour. Instead, where the geographic potential for aquaculture to flourish has been identified, policy makers will need to analyze the seasonal and full-time personnel requirements and ensure that appropriate training is in place, ancillary support operations are encouraged and that an adequate supply of qualified foreign labour and technical staff have been identified.

Aquaculture has totally different financial requirements than traditional fish harvesting. Like land-based farming, it has operational needs for crop acquisition and cultivation. Unlike land farms, however, the industry typically lacks the hard assets that financial institutions look to as forms of collateral. Government agencies will have to invent new financing models if they wish to provide support to the industry. The funds are available—in the form of largely-wasted subsidies and bailouts of traditional and all-too-often-fruitless industrial support. Some "new-thinking" is required.

I hope too that the Nova Scotia government will support the industry in identifying high-value niche markets and help mount a campaign to aggressively promote Nova Scotia aquaculture products wherever economic opportunities exist. The precedent has already been set in the tourism sector—where governments have established major advertising promotions to support small local operators. I would add this qualifier however—that I believe the industry should be prepared to contribute financially to such an initiative. That would not only ensure that the major beneficiaries have some "skin in the game", but would also make sure the campaign is truly focused on a commercial objective.

I wish you the best of luck as you complete the balance of your conference program.

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