

## International Sustainable Aquaculture Strategy



### Why do we need sustainable aquaculture?

Achieving food security for the growing global population can best be met with diverse tools aimed at protecting sustainable food production capacity. One in seven people rely on fish for protein—half of that need is already being met with aquaculture, and in some cases, Asia has done so for centuries. For supply to meet demand and need, we must expand and improve the way we farm fish. Successful herbivore aquaculture may eventually take pressure off wild animals as feed for humans (or feed for animals intended for human consumption). Aquaculture may also be able to provide safer and cleaner food. RAS (Recirculation Aquaculture Systems) provide controls to lower contaminants, use of medicines and growth hormones, and reduce spread of disease. Finally aquaculture allows for community strengthening and independence, especially if traditional fisheries and supply chains are affected by a changing climate.

We need legislation in many nations that will define the goal of sustainable farming of fish and other animals, and call for best technology and solutions. Here at The Ocean Foundation, we have joined with people from Harvard Law School's clinic and the Environmental Law Institute (ELI), to develop the following working definition:

**Sustainable aquaculture** meets the needs of the present, while indefinitely preserving ocean ecosystems and sustaining the communities that depend on them. Executing sustainability in the context of aquaculture is complex and requires the balancing of several core elements:

**Environmental Protection:** Practices that can be sustained indefinitely with minimal to no effects on local water quality, marine ecosystems or wild species, as well as the smallest possible carbon footprint

**Human Welfare:** Contribution to a nutritious local and regional food supply without being threatening to global food security or detrimentally affecting availability or cost of local food sources

**Social Justice:** Sensitivity to human well-being, social equity, and cultural practices

**Economic Viability:** Economic feasibility and long term returns on investment without externalizing losses to the public from an industry perspective, as well as a public perspective (a pre-requisite for any government subsidies)

**Physical Longevity:** Engineering and technology designed to withstand increased storm severity, sea level rise, ocean acidification and other aspects of climate change

**Public Education:** Promotion of public awareness through transparency at each stage of the value chain; and

**Scientific Advancement:** Emphasis on research and development for more sustainable means of production, including cultured species, feed inputs, as well as use of by-products and waste streams

Regulations, favorable tax treatment and other subsidies can be valuable tools in developing a sustainable aquaculture industry if they have the effect of improving performance on one or more of these considerations.

### Evolution toward Recirculating Aquaculture Systems (RAS)

We have plenty of examples that show that we cannot take wild caught animals to a global commercial scale for consumption without driving them to extinction. For most wild prey species, we stopped hunting them or domesticated them (e.g. began farming) before they disappeared in the wild. Hunting and killing wild animals in the ocean is no more a sustainable option.

*tell us what you want to do for the ocean, we will take care of the rest*

Terrestrial	Ocean
Hunting wild animals to meet global food needs is not sustainable and has been largely abandoned-- It is encouraged only where it is the best (and perhaps only) choice for food supply, such as for subsistence hunters	Hunting and killing wild animals in the ocean at levels intended to meet part or all of the protein needs for 1+ billion people is not sustainable: Globally, historic biomass was 10x what it is today, the catch is "fishing down the food chain" to prey fish.
Transition from hunting to ranching, grazing via feeding deer and other hoofed animals through the winter and hunting them the following year	Augmenting hunting by releasing large quantities of fish via hatcheries. The releases from the hatcheries "graze" on resources in the commons, and are then captured at a later stage in life.
Hog and steer finishing operations.	Tuna ranching: (capture of juvenile wild animals and then fattening them in captivity)
When grazing became economically prohibitive, or in conflict with other land uses, we moved to feedlots (polluting, inhumane, required more drugs)	Moved to open pen /open water aquaculture and shrimp farms, (polluting, inhumane, required more drugs)
Forced by regulators, neighbors and NGOs to stop polluting, capture and biogas waste, and begin improvements to reduce inhumane treatment and kill practices	Now in transitional movement to recirculating farming (RAS and aquaponics) (ideally closed systems prevent pollution, escapes, disease introduction) [but will have to watch for humane treatment and best slaughter practices]
CAFO (Concentrated Animal Feeding Operations) laws and private certifying producers (e.g. Niman for pork) establishing framework for humane, drug free production, and slaughter	RAS theoretically can be "no discharge," so possibly a divergence of the land/water analogy in manner needed for regulatory structure; ELI Aquaculture Gold Standard
Humans moved from sometimes eating carnivores to mostly only eating herbivores (chicken, pigs, cows and turkeys)	We are currently eating carnivorous or omnivorous fish.

Thus, we predict we will move toward eating herbivore fish (tilapia, carp, catfish, and trout among others) via RAS because of population growth and feed conversion ratios. This prediction is not without debate, and it may be on a long time scale that we see it play out in wealthy nations like the USA, but globally it may be unavoidable.

### The Challenge

Even with the clear health and other benefits of closed aquaculture systems, some political administrations continue to explore offshore aquaculture as the 'it' solution to a claimed seafood trade deficit, in fact NOAA is examining offshore only technology. Managing aquaculture towards sustainability is a global need. While this should argue for congressional or executive action, the inability to advance ocean-oriented legislation or new support for the National Ocean Policy indicates this will be an uphill battle at the federal level. Thus, we hope to work toward international as well as state-based legislative efforts that can effect positive change.

### Our New Sustainable Aquaculture Program

The Ocean Foundation will also establish and launch a new International Sustainable Aquaculture Program. We at TOF propose to create and house this project and focus on:

- Advising on pilot projects
- Sustainable aquaculture policy and regulatory development
- Sustainable aquaculture certification and eco-labeling
- Private equity for sustainable aquaculture projects (via mission/program/impact related investments)
- Grantmaking to support those seeking to adopt or advocate for sustainable aquaculture (For example, we have a track record of over \$1 million in grants for reforming harmful and unsustainable aquaculture.)

### Why The Ocean Foundation:

The Ocean Foundation is future-oriented, solution-oriented, and a community foundation. Our history of engagement and experience make us a credible thought leader on sustainable aquaculture. We want to provide holistic solutions that help communities meet their protein needs in an economically, socially, and environmentally sound way for decades to come. Your support for TOF's International Sustainable Aquaculture Program will include a significant portfolio of activities, projects, and grantees. To read more on fish, fisheries, and aquaculture please visit [oceanfdn.org/blog](http://oceanfdn.org/blog) to visit some of our recent blog posts.