

Types of Aquaculture

Definitions

- Aquaculture = “cultivation of aquatic organisms in controlled aquatic environments” (source: NOAA)
- Marine aquaculture = aquaculture in the ocean (saltwater = marine)
 - Common species: oysters, clams, mussels, shrimp, salmon, algae (source: NOAA)
- Freshwater aquaculture = aquaculture in freshwater (not the ocean)
 - Common species: trout, catfish, tilapia (source: NOAA)

Sustainable Aquaculture

Like any kind of farming, aquaculture can be done unsustainably. Our goal is sustainable aquaculture.

The World Bank (source: The World Bank), describes sustainable aquaculture as follows:

Aquaculture is projected to be the prime source of seafood by 2030, as demand grows from the global middle class and wild capture fisheries approach their maximum take. When practiced responsibly, fish farming can help provide livelihoods and feed a global population that will reach nine billion by 2050. But for an aquaculture system to be truly sustainable, it must have:

- **Environmental sustainability** — *Aquaculture should not create significant disruption to the ecosystem, or cause the loss of biodiversity or substantial pollution impact.*
- **Economic sustainability** — *Aquaculture must be a viable business with good long-term prospects.*
- **Social and community sustainability** — *Aquaculture must be socially responsible and contribute to community well-being.*

Sustainable aquaculture is a dynamic concept and the sustainability of an aquaculture system will vary with species, location, societal norms and the state of knowledge and technology.

In summary, sustainable aquaculture does not negatively impact: the habitat, nearby plants and animals, or nearby humans. And it has to make money (or else it's not truly 'sustainable'.)

Examples of non-sustainable aquaculture practices:

- Clearing mangroves to grow shrimp
 - Mangroves create an environment for many species
 - Mangroves clean water as it passes through
 - Mangroves reduce damage from tropical storms and tsunamis
- Catching wild fish (e.g. anchovies, sardines) to make fish feed to feed to aquacultured fish (e.g. higher-level predators, like salmon)
- Using large amounts of antibiotics (or other medications) to keep fish from getting sick
 - Monitoring water quality can prevent the need for antibiotics or the development of diseases
- Effluents: fish poop and uneaten fish feed can add nutrients to the water body that can cause, for example, algae blooms
- Growing a non-native species that turns out to be an invasive species when it gets out into the ecosystem

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- **Ranching:** stock (adult) fish from a hatchery in a water body (don't feed them)
 - Seems to be just for fish
 - Mostly done in a fish pond, lake or pond, or river
- **Capture Aquaculture:** grab babies from the wild, raise them in captivity
 - Mostly for species that we do not know how to grow in a hatchery, e.g. eels
- **Unfed Aquaculture:** stock seed (juveniles) from a hatchery, don't need to feed because they are mollusks/seaweeds
 - Mollusks / seaweeds (not fish, that would be ranching)
 - Line/rope or rack/basket type aquaculture
- **Fed Aquaculture:** stock juvenile fish from a hatchery, feed them until you harvest them
 - Seems to be just fish (plants are unfed)
 - Net pen, cage, or fish pond type aquaculture
- **Recirculating Aquaculture:** In a tank, not a water body
 - Any species
 - Closed tank, recirculating aquaculture

Citations

- National Oceanic and Atmospheric Administration (June 2011). "What is Aquaculture?" Retrieved 7 May 2018, from <http://www.noaa.gov/stories/what-is-aquaculture>
- The World Bank (5 Feb 2014). "Sustainable Aquaculture." Retrieved 7 May 2018, from The World Bank website: <https://www.worldbank.org/>