

Is aquaculture really an option?

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This article analyzes the impact of aquaculture on wild fish stocks and on fish consumption, taking into account three key components: (1) the dependence of aquaculture on reduction fisheries for the feeding of the farmed species; (2) biological interactions between the wild edible species -the predator- and the wild feed species -the prey-; (3) consumer preferences on wild and farmed fish. The wild fisheries are in open access while the aquaculture sector is competitive. Following empirical evidence, we assume that on the one hand consumer preferences are carnivorous species-biased, and on the other hand the productivity of aquaculture is all the lower since the farmed species is carnivorous. We show that when biological interactions are moderate, the introduction of aquaculture is beneficial in the long run: it allows consumers to spend more on fish consumption without endangering the wild fish stocks, it improves consumers' utility, it increases global fish supply and alleviates the pressure on the long run edible stock through decreased fish price. However, the choice of the farmed species entails a trade-off between the edible fishery and the reduction fishery which stems from the characteristics of the demand side. The results are deeply modified when biological interactions are strong: the long run steady state may become unstable, the stock of edible wild fish is reduced, and total fish consumption and consumers' utility may decrease.

Keywords: fisheries, aquaculture, consumer preferences, food security, biological interactions.

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