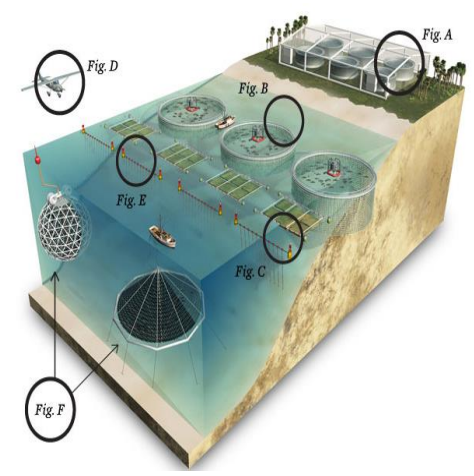
Abstract for Fish Breeding Farm (aquaculture farm)



This abstract reflects general technical and market aspects of fish breeding and fish farming

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INTRODUCTION OF FISH BREEDING

Fish farming is the principal form of aquaculture while other methods may fall under mariculture. Fish farming involves raising fish commercially in tanks or enclosures, usually for food. A facility that releases young (juvenile) fish into the wild for recreational fishing or to supplement a species' natural numbers is generally referred to as a fish hatchery. Worldwide, the most important fish species used in fish farming are carp, salmon, tilapia and catfish.

There is an increasing demand for fish and fish protein, which has resulted in widespread overfishing in wilfisheries. Fish farming offers fish marketers another source. However, farming carnivorous fish, such as salmon, does not always reduce pressure on wild fisheries, since carnivorous farmed fish are usually fed fishmeal and fish oil extracted from wild forage fish. In this way, the salmon can consume in weight more wild fish than they weigh themselves. The global returns for fish farming recorded by the FAO in 2008 totaled 33.8 million tons worth about $US 60 billion.

Limiting growth here is the availability of food supply by natural sources, commonly zooplankton feeding on pelagic algae or benthic animals, such as crustaceans and mollusks. Tilapia species filter feed directly on phytoplankton, which makes higher production possible. The photosynthetic production can be increased by fertilizing the pond water with artificial fertilizer mixtures, such as potash, phosphorus, nitrogen and micro-elements.

DISCOVERY & HISTORY

Because of the fact that most fish are carnivorous, they occupy a higher place in the trophic chain and therefore only a tiny fraction of primary photosynthetic production (typically 1%) will be converted into harvestable fish. Another issue is the risk of algal blooms. When temperatures, nutrient supply and

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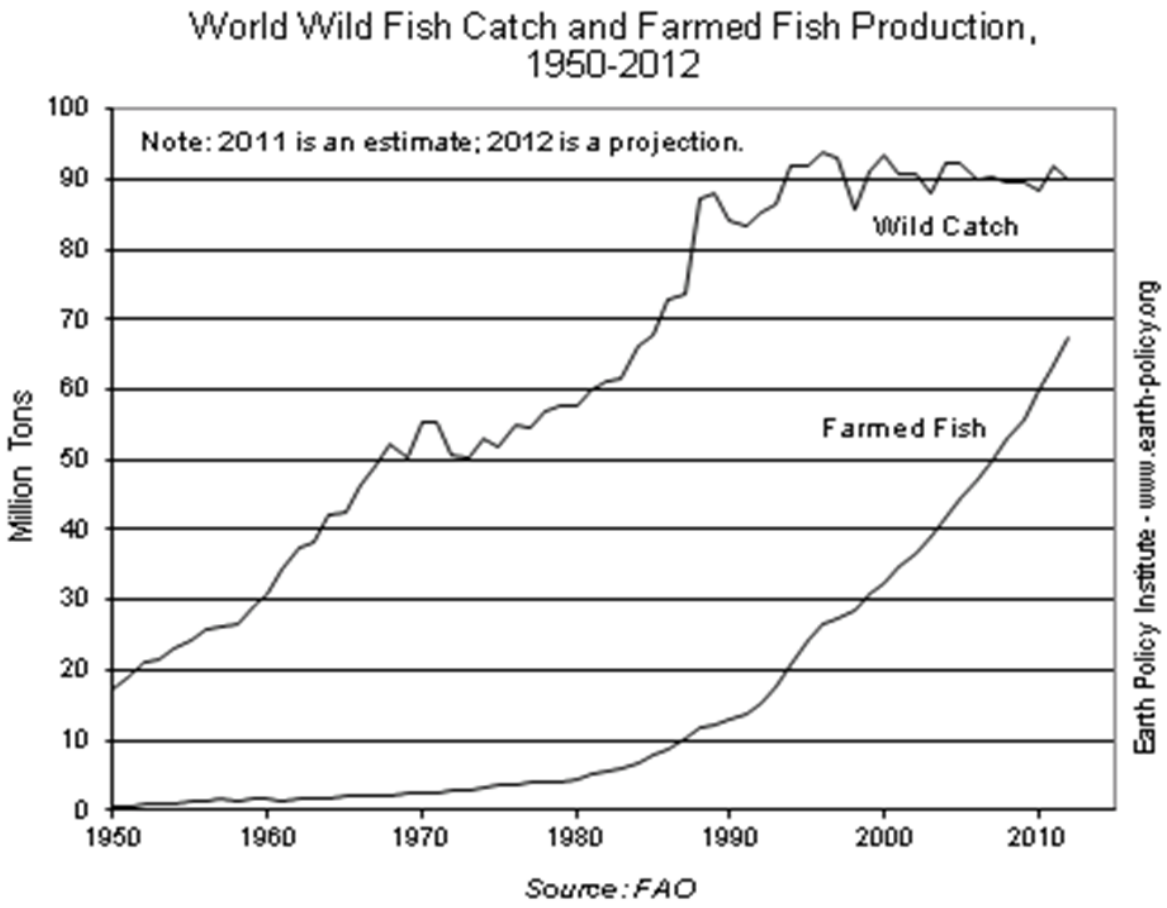
available sunlight are optimal for algal growth, algae multiply their biomass at an exponential rate, eventually leading to an exhaustion of available nutrients and a subsequent die-off. The decaying algal biomass will deplete the oxygen in the pond water because it blocks out the sun and pollutes it with organic and inorganic solutes (such as ammonium ions), which can (and frequently do) lead to massive loss of fish. The given graph shows that both wild catch fish as well as farmed fish production increase tremendously, whereas the growth of farmed fish production was even significantly higher and more consistent in the last years. As you can see beside, the wild fish volume stagnates in the last twenty years, which can be traced back to the fact that the catch limits are already reached.



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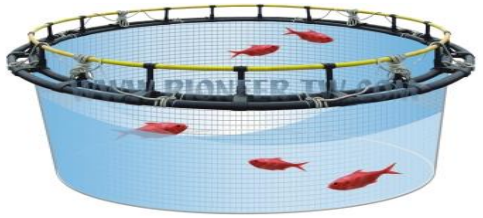
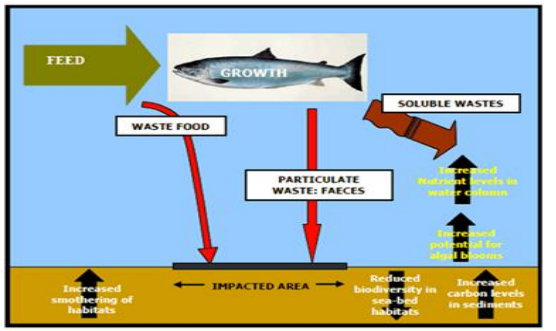
Breeding Process

An alternate option is to use a wetland system such as that of Veta La Palma.

In order to tap all available food sources in the pond, the aquaculturists will choose fish species which occupy different places in the pond ecosystem, e.g., a filter algae feeder such as tilapia, a benthic feeder such as carp or catfish and a zooplankton feeder (various carps) or submerged weeds feeder such as grass carp. Despite these limitations many fish farming industries use these methods. In the Czech Republic thousands of natural and semi-natural ponds are harvested each year for trout and carp. The large ponds around Trebon were built from around 1650 and are still in use. Cage system fish cages are placed in lakes, bayous, ponds, rivers or oceans to contain and protect fish until they can be harvested.



The method is also called "off-shore cultivation" when the cages are placed in the sea. They can be constructed of a wide variety of components. Fish are stocked in cages, artificially fed, and harvested when they reach market size. A few advantages of fish farming with cages are that many types of waters can be used (rivers, lakes, filled quarries, etc.), many types of fish can be raised and fish farming can co-exist with sport fishing and other water uses. Cage farming of fishes in open seas is also gaining popularity. Concerns of disease, poaching, poor water quality, etc., lead some to believe that in general, pond systems are easier to manage and simple to start.



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Past occurrences of cage-failures led to escapes, raised concern regarding the culture of non-native fish species in open-water cages. Even though the cage-industry has made numerous technological advances in cage construction in recent years, the concern for escapes remains valid.

Recently, copper alloys have become important netting materials in aquaculture. Copper alloys are anti-microbial, destroying bacteria, viruses, fungi, algae, and other microbes. In the marine environment, the antimicrobial / algaecidal properties of copper alloys prevent biofouling, which can briefly be described as the undesirable accumulation, adhesion, and growth of microorganism, plants, algae, tube worms, barnacles, mollusks, and other organisms.

The resistance of organism growth on copper alloy nets also provides a cleaner and healthier environment for farmed fish to grow and thrive.

In addition to its antifouling benefits, copper netting has strong structural and corrosion-resistant properties in marine environments.

Copper-zinc brass alloys are currently (2011) being deployed in commercial-scale aquaculture operations in Asia, South America and the USA (Hawaii). Extensive research, including demonstrations and trials, are currently being implemented on two other copper alloys: copper-nickel and copper-silicon. Each of these alloy types has an inherent ability to reduce biofouling, cage waste, disease, and the need for antibiotics while simultaneously maintaining water circulation and oxygen requirements. Other types of copper alloys are also being considered for research and development in aquaculture operations. Aquaculture, also known as aquafarming, is the farming of aquatic organisms such as fish, crustaceans, molluscs and aquatic plants. Aquaculture involves cultivating freshwater and saltwater populations under controlled conditions, and can be contrasted with commercial fishing, which is the harvesting of wild fish. Mariculture refers to aquaculture practiced in marine environments

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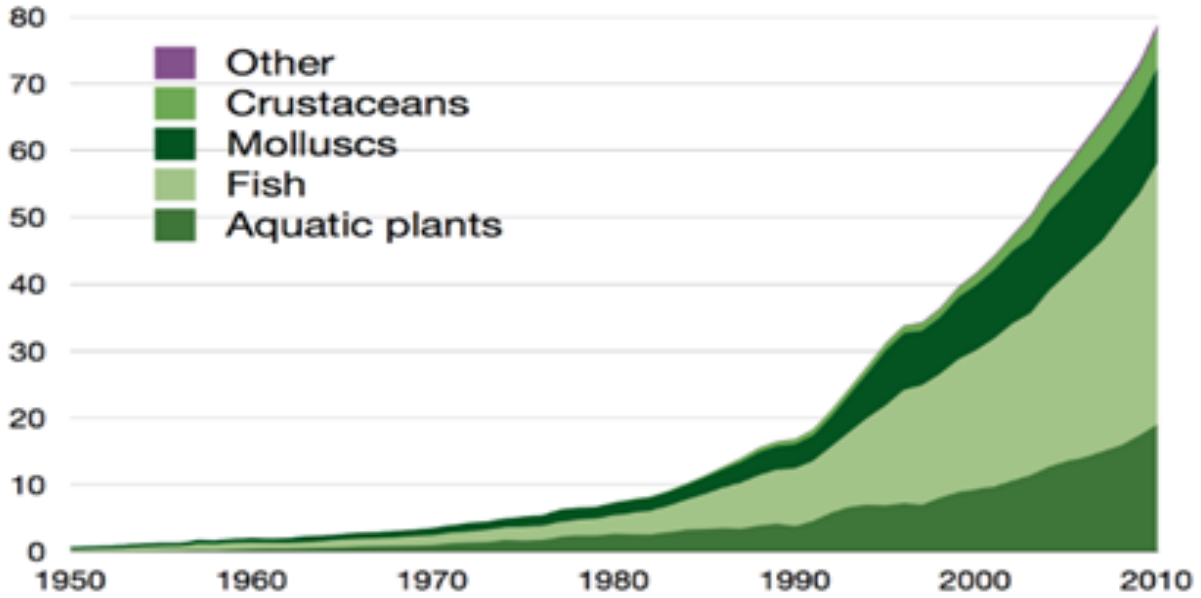
and in underwater habitats.
The reported output from global aquaculture operations would supply one half of the fish and shellfish that is directly consumed by humans, however, there are issues about the reliability of the reported figures.
Further, in current aquaculture practice, products from several pounds of wild fish are used to produce one pound of a piscivorous fish like salmon. Particular kinds of aquaculture include fish farming, shrimp (such as seaweed farming), and the cultivation of ornamental fish. Particular methods include aquaponics and integrated multi-trophic aquaculture, both integrate fish farming and plant farming.



Summing up the aforementioned information, we can say that there exist various forms of fish farming in technical terms, various potential location to apply fish farming (river, lake, sea, pond, indoor etc.) for various types of fish, algea or crustaceans. But one trend seems to be clear regarding the market development. The share of farmed fish will increase and outweigh the

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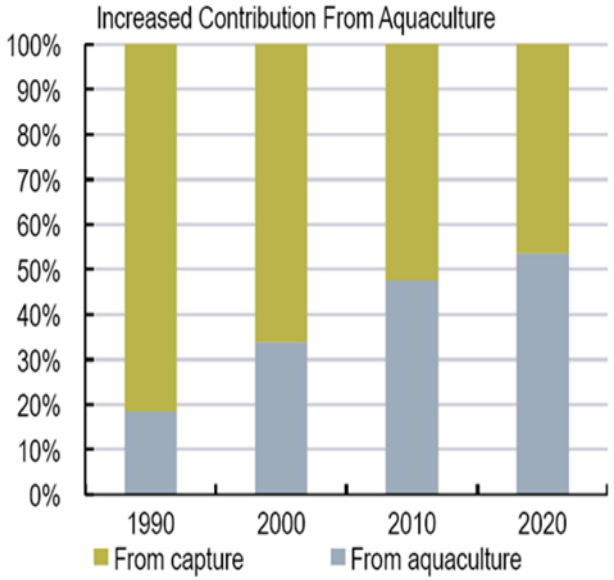
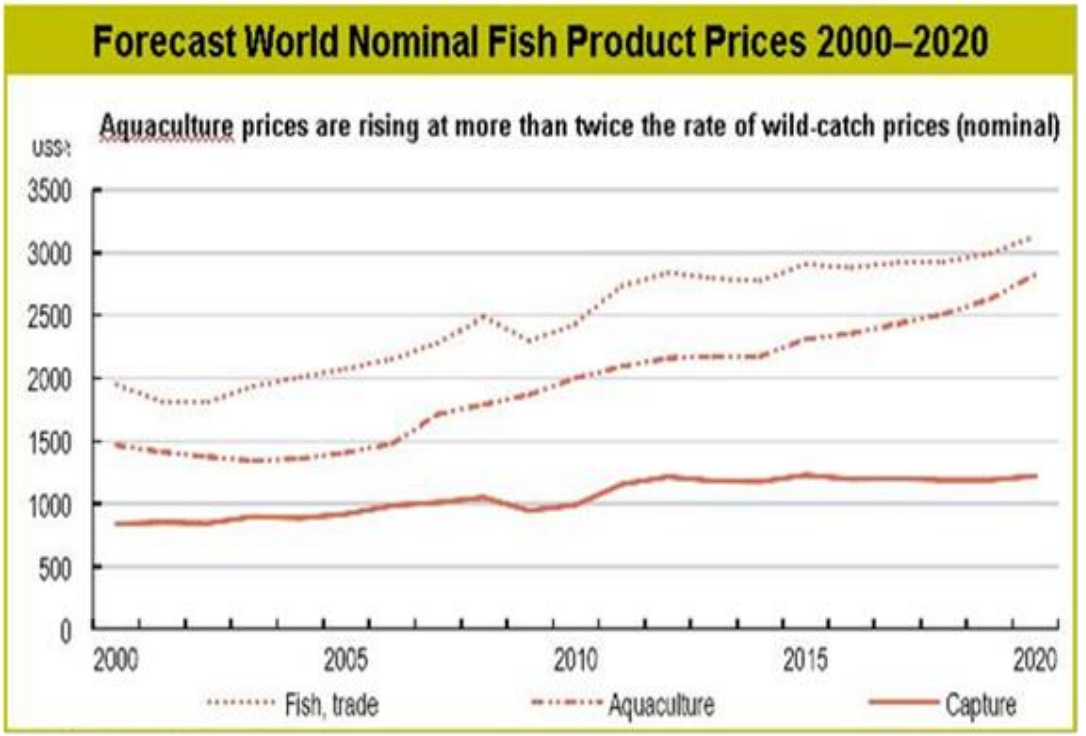
total amount of wild catch. The expected price development of wild and farmed fish will increase this trend continuously.





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