

Some cultures are more involved with the ocean than others. Japan, for example, has little land for grazing. It is largely mountainous and what level land there is has been used for the building of cities. Japan, like Oceania (the Pacific islands – Polynesia, Melanesia, and Micronesia) has used the ocean the way that Americans have used the Great Plains. Both the Pacific cultures and Japan are very similar in that way. While they do grow food as well, there is much more use of sea food than there is say of the Cheyenne or Arapaho who live on the Plains in the U.S.

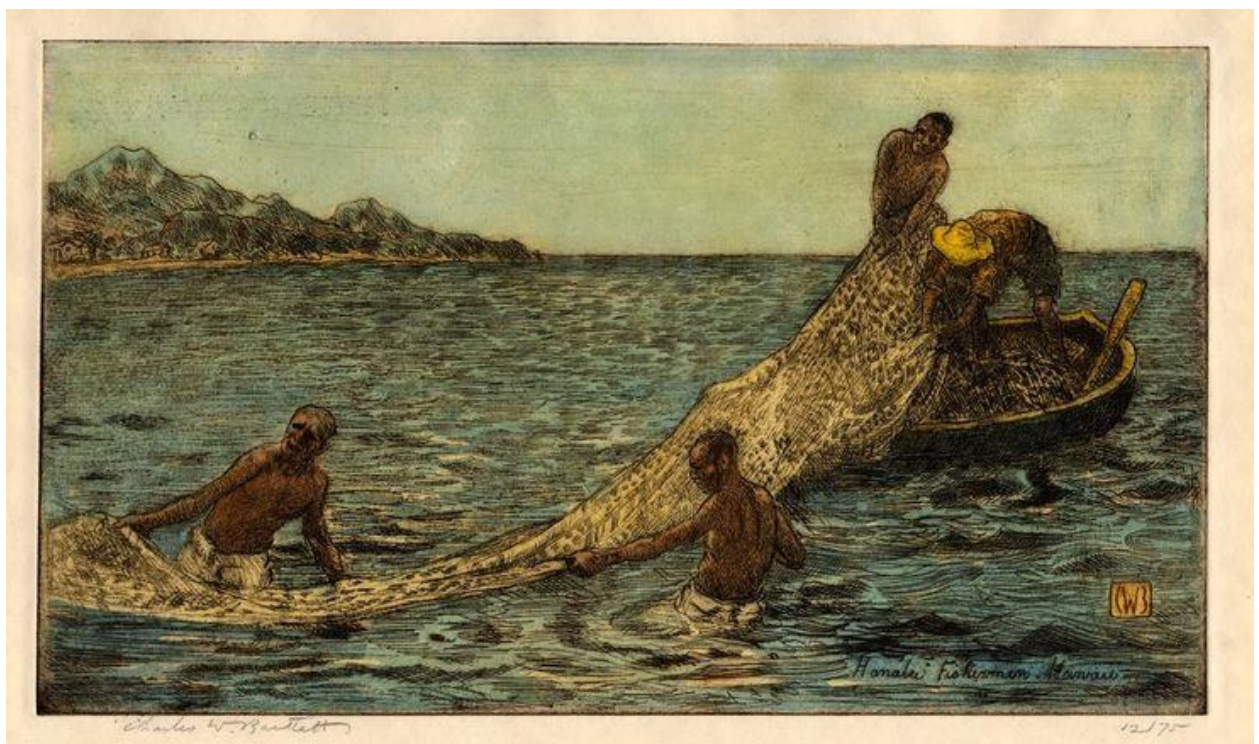
However, there has certainly been a similar development in fishing techniques among many people that in a sense parallels that of the people who have developed more agrarian economies.

One might start with the catching of fish either by hand or with a spear or a hook. These techniques generally involve catching a single fish at a time and basically “hunting” fish and “gathering” plant life or some sessile or near sessile animals.





Later people found ways to catch many fish at a time by constructing nets or building weirs. This is perhaps akin to "horticulture".



Finally, there is “fish farming” in which people actual build a kind of “fish pen” in which fish can be raised and in effect “farmed”.

This last approach has developed a number of terms to describe it:

FISH FARMING:

Mariculture: Raising fish in the ocean (salt water)

Aquaculture: Raising fish in fresh water



In some cases this has been productive, but the fish are being raised in water which may be polluted in which case there can be problems with the fish. Another approach has been to raise fish in tanks where there are plants. The fish are raised in pure water with some nutrients added. The fish eat the plants which are also oxygenating the water. The fish produce carbon dioxide from breathing and excrete materials which nourish the plants. The plants photosynthesize and produce oxygen for the fish (along with food). The tanks become closed ecological systems. Fish raised in this way for food can be raised almost anywhere and as a result do not have to be transported great distances to land locked populations.



As populations of human grew and continue to grow, there is a greater need for food to feed the growing numbers of people. This has resulted in a number of changes on the ways in which people have dealt with the need for more and more food. On land there is a great deal of fertilizer used to produce more food from the same amount of ground (This parallels the problems of "efficiency" in which less human energy is needed to produce the same results, or the same amount of human energy is used to produce greater results (remember the spear, adl adl and the bow and arrow).

Earliest people did their fishing near the land. Fishing and navigation are tied together. You can sail out of sight of land and get fish, but if you cannot find your way back, it is meaningless.

About 40,000 years ago in East Timor Indonesia there is strong indication that people were traveling into deep waters out of sight of land and fishing.



Sites show large numbers of fish bones that come from tuna, a deep ocean fish indicating that people were traveling far out into the ocean and catching large fast moving fish. The technique is not known, but the number of the bones indicates that this was not an accidental catch of one or two tuna.



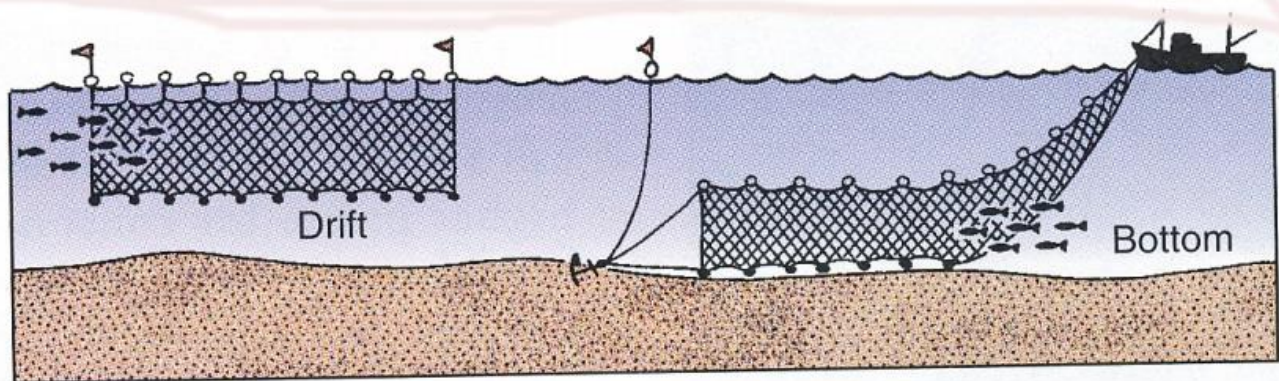
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East Timor and the surrounding countries. The inset shows the composing territories: the mainland (with capital Dili), the enclave of Ocuissi-Ambeno, and the island of Atauro. There's still the tiny isle of Jaco, unnoticeable at these scales, but that can be imagined as a dot in the easternmost of Timor. Across the Timor Sea, Australia is at about 450 km away, and Java 1000 km.

More recently a number of techniques have been used for catching large numbers of fish. These are:

Gill nets



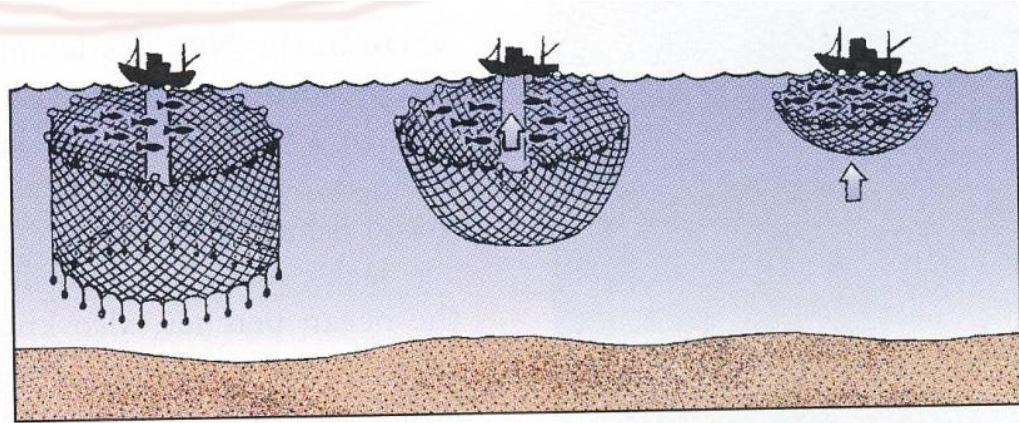
(a) Gill nets

Gill nets are not restricted to commercial fishing. They date well back to antiquity. The nets can be made with different size openings. The larger the opening, the larger the fish that is caught (that is smaller fish can swim through larger ones cannot).

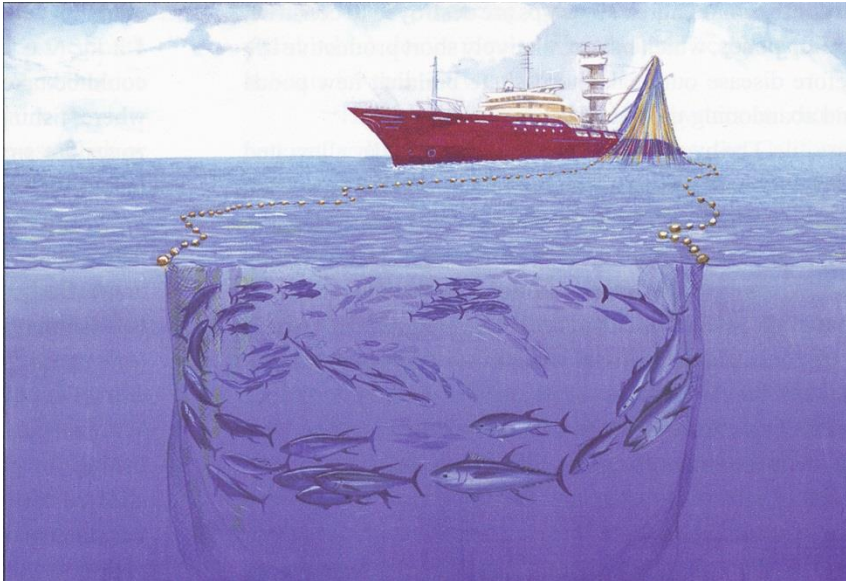
Currently the size of the openings and the strength of the netting are heavily regulated. This is done to prevent some "over fishing" (taking too many of the same kind of fish) and trying to avoid catching many kinds of fish which may not be what is wanted (by catch)

Some materials used in making nets is resistant to decay, and such equipment when it breaks loose, continue to "fish" even though there are no people to catch the fish and use them for food. This catching of fish by fishing equipment that has broken loose is known as "ghost fishing"

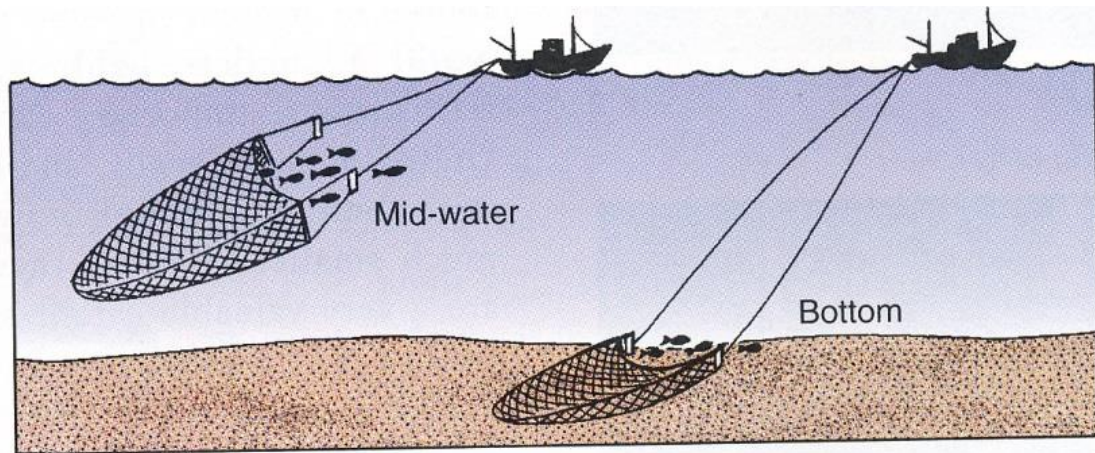
Purse seine



(b) Purse seine

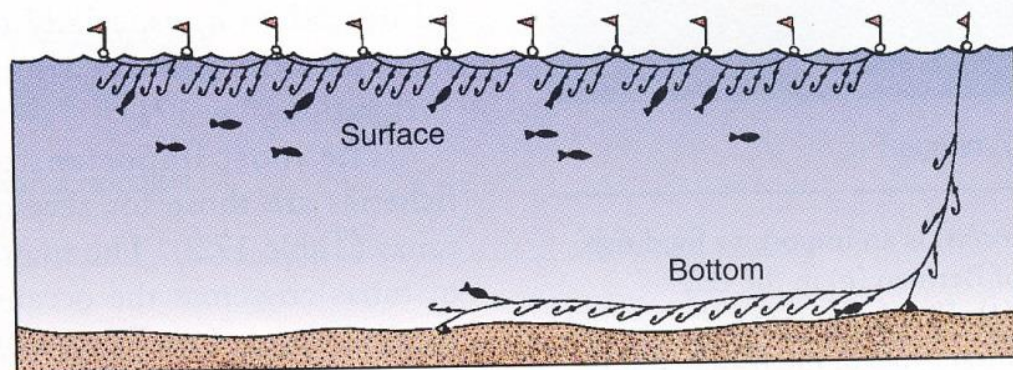


Trawls



(c) Trawls

Long line



(d) Longline

SOME PROBLEMS WITH FISHING

Who owns the oceans????

There are a number of problems with fishing in the ocean since the oceans are "free". But with a 200 mile limit now in use, more fish fall within the different countries' borders and foreign vessels may try to fish there despite the laws.

In America, there were a number of problems with Russian ships trawling in American waters and destroying the ocean bottom, thereby upsetting the habitats of much marine life.

Maximum sustainable yield:

The greatest catch of a species that will ensure the long term viability of the species.

Recruitment overfishing:

Recruitment overfishing occurs when the mature adult population (spawning biomass) is depleted to a level where it no

longer has the reproductive capacity to replenish itself—there are not enough adults to produce offspring. Studies show that within 15 years of a new fishery opening about 80% of the largest fish are taken.

Growth overfishing:

Growth overfishing occurs when fish are taken too small, before the fish have grown to a size that produce the maximum yield. This reduces the value of the catch since if the fish were to grow, the individual fish would weigh more and bring a higher price in the market.

Overfishing occurs when many fishermen become attracted to the same new fishing industry. As a result many people move in to take the fish. The numbers start to decline. Best option: stop fishing for that fish. Does it happen? No.

Do fishermen understand these problems?

Yes, but they have families to feed and bills to pay. Often they have taken out loans for boats and equipment.

Among the problems found with these techniques is the problem of "BY CATCH". Large fishing vessels generally go after one or two types of fish, but

While originally it was thought that the ocean had an exhaustible supply of food, it appears this is not the case. Fish supplies have been dwindling and several species have become extinct or reached near extinction levels of population.

There is a possibility that some of these "near extinction" populations may rebound. The California Gray whale which was on the endangered species list has been removed from the list. The North Atlantic Right Whale has a very debatable future and while there are many regulations in effect concerning the whale (how close one

can come to one of them and restricting the speed of boats in the areas where they are found), there are some who feel that the species may not recover.