

Different Types of Aquaculture Techniques

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ABOUT THE STUDY

Fish farming, sometimes referred to as aquaculture, can occur on land, in lakes, or in the ocean. The aquaculture sector of the fish business is expanding at a rapid rate and is expected to produce more seafood in the coming years than any other. It has been viewed as both the seas' savior and their destruction. Knowing how the fish are farmed is crucial since different aquaculture technologies have varying effects on the environment. Some of the most popular aquaculture techniques have advantages and disadvantages.

Types of aquaculture techniques

Open aquaculture system/sea-cage (active feeding): Open sea-cage aquaculture is the practice of housing aquatic organisms in natural waterways. Open systems are being introduced in a range of ecosystems, including freshwater rivers, brackish estuaries, and coastal marine zones. The volume of the operation and the species being cultivated determine the size of the floating mesh cages. Young stock is gathered from hatcheries or wild populations and reared in enclosures until it is of a size that may be sold. The majority of fish grown in open water are carnivorous species that use fishmeal (pellets made up of tiny schooling fish species) as a diet. Some of the open-water species with rapid population growth include barramundi, trout, Atlantic salmon, yellowtail kingfish, southern blue fin tuna, and others. Aquaculture in open sea cages has expanded, which has led to several problems. One of the primary problems is the need for fishmeal to feed predatory animals. In certain circumstances, producing only 1 kilogram of marketable fish requires more than 5 kilos of fishmeal. Other issues include the possibility for escape and interbreeding with wild species, an increase in illness and parasite transmission caused by high fish numbers, and poor water quality caused by a buildup of wastes.

Open aquaculture system/Sticks, racks, ropes and cages (passive feeding): In systems that are exposed to natural streams, several different species of shellfish are farmed. Larval stages can be produced in hatcheries or discovered in the wild. Then, these are dropped into the water column using a variety of techniques, such as ropes or poles attached to them or cages over them. The

most popular species cultivated using these methods are mussels and oysters. These filter feeding species are able to meet their nutritional requirements by taking nutrients from the water column instead of fishmeal. It is possible to classify the aquaculture of mussels, oysters, and other filter feeders as ecologically benign. There is little impact on marine habitats or water quality if the water flow is enough. The disposal of sticks and racks could be problematic in some areas.

Semi-closed aquaculture system: When a species is raised on land and water is transferred between the farm and a natural river, semi-closed aquaculture is employed. Wastewater is released into the nearby canal while fresh water is pumped back into the system to refresh the farm. The most prevalent form of semi-closed aquaculture in Australia is prawn farming, which also makes the most extensive use of pond systems. The most frequently farmed species is the black tiger prawn, though banana, kuruma, and brown tiger prawns are also grown for the seafood industry. As a less expensive option, vannamei prawns from Southeast Asia are becoming more readily accessible in marketplaces. Operations that use semi-closed aquaculture have the potential to significantly affect coastal ecosystems. Since ponds require continual water exchange and are usually found near rivers when coastal wetlands and mangroves are recovered for building. The end result might be a large loss of habitat, which is essential for the early life stages of many species. A continual flow of water might harm the area's water quality if it is not managed appropriately. With conversion ratios ranging from 1-3 kg of feed to 1 kg of prawns, fishmeal (pellets made up of microscopic schooling fish species) is added, placing stress on wild fish populations.

Closed aquaculture system: Closed system aquaculture refers to the land-based reproduction of aquatic animals in ponds, tanks, and raceways. Recirculation technology is used to circulate water through filters and then return it to the aquaculture system. While limiting interaction with natural streams, this technique often maintains good water quality. Silver perch, barramundi, yabbies, and marron are the most frequently cultivated marketable species; they are all raised in confined aquaculture systems. Blacklip and greenlip abalone are the main marine species produced in closed systems, and both are expanding

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significantly in response to demand from Asian markets. One of the most ecologically benign methods for raising aquatic animals is closed system aquaculture. Carnivorous aquaculture species may be fed fishmeal (pellets made of microscopic schooling fish),

which is problematic since it depletes the populations of wild fish. There is virtually little interaction with rivers as a result of the strict regulation of wastewater and the prevention of fish escape.