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A Brief Note on Mariculture

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Commentary

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ABOUT THE STUDY

Mariculture is the growth of aquatic creatures in seawater, which is often done in sheltered seaside or offshore environments. Mariculture includes the farming of marine fish, as well as the cultivation of marine crustaceans (such as shrimp), mollusks (such as oysters), and seaweed. In the United States, channels catfish (*Ictalurus punctatus*), hard clams (*Mercenaria*), and Atlantic salmon (*Salmo salar*) are popular.

Integrated Multi-Trophic Aquaculture (IMTA) is a method of recycling byproducts (trash) from one species to become inputs (fertilisers, food) for another. Fed aquaculture (such as fish and shrimp) is combined with inorganic extractive and organic extractive aquaculture (such as shellfish) to create balanced systems for environmental protection (biomitigation), economic strength.

The inclusion of organisms from multiple trophic or nutrition levels in same system is referred to as "multi-trophic." This is one possible difference from the age-old practise of aquatic polyculture, which might simply be the co-culture of multiple species of fish from the same trophic level. In this situation, these creatures may all contain the same biological or chemical processes, with minimal synergistic benefits, potentially leading to dramatic changes in the environment. The term "integrated aquaculture" is sometimes used to indicate the integration of monocultures *via* water transfer. To all intents and purposes, the names "IMTA" and "integrated aquaculture" differ solely in their descriptiveness.

Netting in aquaculture fish cages around the world is made of a variety of substances, including nylon, polyester, polypropylene, polyethylene, plastic-coated welded wire, rubber, proprietary rope products (Spectra, Thorn-D, Dyneema), galvanised steel, and copper. All of these substances were chosen for varied purposes, including design flexibility, structural strength, cost, and resistance to corrosion.

Copper alloys have recently become essential netting materials in aquaculture due to their antibacterial properties (they destroy bacteria, viruses, fungi, algae, and other microbes) and hence prevent biofouling. Copper alloy aquaculture cages reduce the costly net changes required with other materials by limiting microbial growth. The resistance of strong capacity on copper alloy nets creates a cleaner and healthier ecosystem for fish farming to grow and thrive in.

Wild forage fish are given to some carnivorous and omnivorous aquaculture fish species. Despite the fact that carnivorous farmed fish accounted for only 13% of aquaculture industry by weight in 2000, they accounted for 34% of aquaculture production by revenue. Carnivorous species like salmon and shrimp are farmed, resulting in a significant need for fodder fish to supplement their diet. Fish do not manufacture omega-3 fatty acids; instead, they obtain them by devouring microalgae that make them, as in the case of forage fish like herring and sardines, or by consuming prey fish that have acquired omega-3 fatty acids from microalgae, as in the case of fatty predatory fish like salmon.

A variety of factors, including stocking density, behavioural interactions, sickness, and parasitism, can have an impact on aquaculture welfare. The fact that these concerns are frequently interconnected and influence one other at different periods makes establishing the source of reduced welfare difficult. The capacity factor of the stocked environment and the quantity of individual space required by the fish, which is species specific, are generally used to determine the optimal stocking density. The key to increasing the welfare of marine farmed organisms is to keep stress levels low, as prolonged or recurrent stress can have a variety of negative consequences. Attempts to reduce stress can occur at any point during the culturing process. Understanding and providing the necessary environmental enrichment can help to reduce stress and anxiety.

Coastal ecosystems are becoming increasingly threatened by aquaculture. Since 1980, around 20% of mangrove areas have been devastated, owing in part to shrimp cultivation. An in-depth cost–benefit study of the whole economic worth of shrimp farming on mangrove ecosystems revealed that the extra costs were far more than the advantages.