



Importance of Integrated Multi Tropic Aquaculture

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DESCRIPTION

Integrated Multi-Trophic Aquaculture (IMTA) provides by-products, including waste, of one aquatic species as inputs (fertilizer, food) of another aquatic species. Aquaculture companies combine fed aquaculture (fish, shrimp, etc.) with aquaculture of inorganic extracts (algae, etc.) and organic extracts (crustaceans, etc.) for environmental remediation (biological mitigation) and economic stability (Improvement, low cost, product diversification and risk reduction) and social acceptance (better management practices)[1].

Relevant biological and chemical processes mutually benefit organisms and improve ecosystem health through proper species selection and diverse population sizing to provide the required ecosystem functions. A stable equilibrium can be achieved.

Ideally, the seeds grown together produce valuable commercial crops. IMTA can synergistically increase total yields even if some crops yield less than short-term single crops.

Technology

"Integrated" refers to intensive and synergistic cultivation using water-borne nutrients and energy transfer. "Multi-trophic" means that different species occupy different trophic levels. Different links in the food chain but all those are adjacent[2].

IMTA is a special form of ancient practice of aquatic polyculture, which was often a co-culture of different species, regardless of trophic stage. In this broader case, organisms may share biological and chemical processes that may complement each other to a minimum, resulting in reduced production by both species due to competition for the same food resource. However, some traditional systems, such as Chinese carp multiculturalism using species that occupy multiple niches in the same pond, and fish farming integrated into terrestrial agricultural species, can be considered as a form of IMTA.

The more general term "integrated Aquaculture" is used to describe the integration of single cultivation by water transfer between aquaculture systems. The terms "IMTA" and "integrated

aquaculture" are primarily of different accuracy and are sometimes interchanged. Aquaponics, fractional aquaculture, integrated agriculture aquaculture systems, integrated peri-urban-aquaculture systems, and integrated fisheries-aquaculture systems are all variations of the IMTA concept. "

Approaches

Today, low-intensified traditional/accidental, multi-trophic aquaculture is much more common than modern IMTA. Most are relatively simple, like fish, seaweed and crustaceans [3].

True IMTA can be used on land with ponds and tanks, or in marine or freshwater systems. The implementation contains a combination of types. Crustaceans/Shrimp, Fish/Seaweed/Crustaceans, Fish/Seaweed, Fish/Shrimp, Seaweed/Shrimp.

IMTA in open water (offshore cultivation) can be done by the use of buoys with lines on which the seaweed grows. The buoys/lines are placed next to the fishnets or cages in which the fish grows. In some tropical Asian countries some traditional forms of aquaculture of finfish in floating cages, nearby fish and shrimp ponds, and oyster farming integrated with some captured fisheries in estuaries can be considered a form of IMTA. Since 2010, IMTA has been used commercially in Norway, Scotland, and Ireland. In the future, systems with other components for additional functions, or similar functions but different size brackets of particles, are likely to be done[4].

Sustainability

IMTA promotes economic and environmental sustainability by converting supplied organism by-products and inedible feed into harvestable crops, thereby reducing eutrophication and economic diversification promotes it [5].

Properly managed multi trophic aquaculture accelerates growth without harmful side effects. This increases the capacity of the site for cultivated organisms and reduces the negative impact on the environment. IMTA allows farmers to diversify their production by replacing purchased inputs with low-nutrient by-products, often in the absence of new locations. Early economic

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studies suggest that IMTA can increase profits from weather, illness and market volatility and reduce financial risk.

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