Perspective

iMedPub Journals
www.imedpub.com

Insights in Aquaculture and Biotechnology

2022
Vol.6 No.6:035

The Role of Shrimp Aquaculture

Klaus Plowden*

Department of Aquaculture Science, Federal University of Technology, Minna, Nigeria

***Corresponding author:** Klaus Plowden, Department of Aquaculture Science, Federal University of Technology, Minna, Nigeria, Email: lawal_m@gmail.com

Received date: October 29, 2022, Manuscript No: IPIAB-22-15391; **Editor assigned date:** November 01, 2022, PreQC No. IPIAB-22-15391 (PQ); **Reviewed date:** November 12, 2022, QC No. IPIAB-22-15391; **Revised date:** November 22, 2022, Manuscript No. IPIAB-22-15391 (R); **Published date:** November 29, 2022, DOI: 10.36648/Ipiab.6.6.35

Citation: Plowden K (2022) The Role of Shrimp Aquaculture. Insights Aquac Cult Biotechnol Vol.6 No.6: 035

Description

Mariculture or marine farming is a specialized branch of aquaculture involving the cultivation of marine organisms for food and other animal products, in enclosed sections of the open ocean, fish farms built on littoral waters, or in artificial tanks, ponds or raceways which are filled with seawater. An example of the latter is the farming of marine fish, including finfish and shellfish like prawns, or oysters and seaweed in saltwater ponds.

Shrimp Aquaculture

Aquaculture has been celebrated globally and believed to usher in a viable alternative to capture fisheries. It is most welcomed especially now that the world population explosion has pushed the demand on fisheries products to worrisome limits. Shrimp farming is an area of aquaculture that has witnessed significant growth in recent years, contributing substantially to the global aquaculture production. However, intensification of shrimp aquaculture has come with unintended consequences such as wastewater management and other problems emanating from environmental impact of the wastewater.

There has been considerable discussion as to how mari-culture of seaweeds can be conducted in the open ocean as a means to regenerate decimated fish populations by providing both habitat and the basis of a trophic pyramid for marine life. It has been proposed that natural seaweed ecosystems can be replicated in the open ocean by creating the conditions for their growth through artificial upwelling and through submerged tubing that provide substrate. Proponents and permaculture experts recognize that such approaches correspond to the core principles of permaculture and thereby constitute marine permaculture. The concept envisions using artificial upwelling and floating, submerged platforms as substrate to replicate natural seaweed ecosystems that provide habitat and the basis of a trophic pyramid for marine life. Following the principles of permaculture, seaweeds and fish from marine permaculture arrays can be sustainably harvested with the potential of also sequestering atmospheric carbon, should seaweeds be sunk below a depth of one kilometer. As of 2020, a number of successful trials have taken the idea has received substantial public attention, notably featuring as a key solution covered by Damon Gameau's documentary 2040 and in the book drawdown: The most comprehensive plan ever proposed to reverse global warming edited by paul hawken.

Seed Supply

Bivalve mollusc larvae are either collected from natural grounds using material to which they adhere or produced in hatcheries by artificial fertilization. Larvae that have set to their substrate are grown in hanging cultures (suspended from floating rafts or long lines on strings, trays, stacks or mesh bags), vertical or rack culture platforms), bottom culture (shells, stones, rocks or cement slabs added to the ground), or in land-based systems

The brood-stock can be domesticated or a mix of domesticated and wild animals. Most species are grown from larvae or fry produced in hatcheries. Spawning is often stimulated with a hormone application. Cage culture can be divided into inshore and offshore cages and can be fixed, floating or submerged. Inshore cages are located in protected, shallow areas with less water circulation. Offshore cages are located in deep water and open areas with less protection from storm but with better water exchange. Nets and fish pen are located in shallow water and their edges are anchored to the bottom. A typical fish pond system consists of the following basic components: pond compartments enclosed by dikes, canals for supply and drainage of water and gates or water control structures

Eutrophication defined as nutrient enrichment (mainly N and P) is considered by some the most important pollution threat to marine waters. This problem is often mentioned in the context of intensive culture of fish and shrimp, where a lot of artificial feed are used. Waste consists of uneaten feed and faeces moving down into the benthos: below fish cages in areas with low currents waste sedimentation leads to a shift in benthic populations towards pollutant-resistant species. This effect is mostly limited to a distance of 50-100 m from the mariculture facilities. Another part of the waste products consists of CO2, dissolved organic carbon and various soluble nutrients (ammonia and phosphate) which are dispersed over the water column.

To date, anthropogenic input of nutrients (not only by mariculture) have caused major changes in structure and

functioning of phyto and zooplankton, benthic and fish communities. For example, observations over a two-decade period show that long-term exposure to aquaculture effluents with high nutrient concentrations are a serious threat to coastal ecosystems along the whole Chinese coast, and in particular to seagrass meadows, which have largely disappeared. Areas with limited water exchange are at even greater risk.

High-value marine carnivorous finfish need animal sources of protein. Most of this comes from marine fish in the form of fish meal. The fish meal is made from small pelagic wild fish anchoveta and atlantic herring. This practice raises two main issues. One is that less food is left for marine predators like seals and seabirds and for commercially valuable predatory fish like cod. The other concern is human food security. Often 2-5 times more fish protein is put into the farmed species than is supplied by the farmed product. Such a concern does not exist for herbivorous filter feeders, who are net protein producers. Culture of more low trophic level species or groups (omnivore fish, mollusks and seaweed) should be stimulated. Unfortunately, there are few attractive herbivorous fish species in the marine environment.