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**BIOFLOC FISH TECHNIQUE**

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# Bio-floc Fish Technique

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## INTRODUCTION

With increasing global population, that is expected to reach 9.6 billion by year 2050 on earth, the demand for aquatic food carries on to increase and hence expansion and intensification of aquaculture production are highly required. The first goal of aquaculture expansion must be to produce more aquaculture products without significantly increasing the usage of the basic natural resources of water and land. The second goal is to develop sustainable agriculture systems that will not damage the environment. The third goal to build up systems providing an aquatic cost or benefit ratio to support economic and social sustainability. These three prerequisites for sustainable aquaculture development can be met by biofloc technology. By adopting this profitable method of fish farming more seafood can be produced by using some resources.

## BIOFLOC FISH FARMING

The term “biofloc” applies to a compound made out of 60-70% of organic matter, which includes a heterogeneous mixture of microorganisms (fungus, algae,

protozoan & rotifers) and 30-40% of inorganic matter such as colloids, organic polymers and some dead cells.

Biofloc is a profitable method of fish farming. It has become very popular all around the world as an alternative to open pond fish farming. The principle of this technique is to recycle the nutrients. If carbon and nitrogen are well balanced in the solution, ammonium in addition to organic nitrogenous waste will be converted in to bacterial biomass. By adding carbohydrates to the pond, the heterotrophic bacterial growth is stimulated and nitrogen uptake through the production of microbial proteins take place. By enhancing water quality through the addition of extra carbon to the aquaculture system, through an external carbon source or elevated carbon content of the feed. By this increasing nitrogen uptake by bacterial growth decreases the ammonium concentration more rapidly than nitrification. Immobilization of ammonium by heterotrophic bacteria occurs much more rapidly because the growth rate of microbes biomass yield per unit substrate of heterotrophs 10% higher than that of nitrifying bacteria.

## PREPARATION OF INOCULUM

For 15000 litres of fresh water 150 litres of inoculum is required for the floc development

Step 1 - Take clean tub/ can with 150 litres of water and continue vigorous aeration

Step 2 - Add 3 Kg of pond soil + 1.5 gm of Ammonium sulphate/urea +30 gm of carbon source (Jaggery/Wheat flour/ Tapioca flour)

Step 3 - Mix it well with water in tube and provide adequate aeration

Step 4 - The inoculum will be ready after 24-48 hrs and it can be transferred to main tank

- Daily addition of carbon source is required for the development of floc. For every 1kg of feed given (with 25% of crude protein), 600gm of carbon source is to be added to the system to maintain C:N of 10:1.

### SPECIES SUITABLE FOR BFT

Biofloc system is most suitable for species that can tolerate high solids concentration in water and are generally tolerant of poor water quality. Some of the species that are suitable for BFT,

- Air breathing fish like Singhi (*Heteropneustes fossilis*), Magar (*Clarias batrachus*), Pabda (*Ompok pabda*), Anabas/Koi (*Anabus testudineus*), Pangasius (*Pangasianodon hypophthalmus*).

- Non air-breathing fishes like Common Carp (*Cyprinus carpio*), Roju (*Labeo rohita*), Tilapia (*Oreochromis niloticus*), Milkfish (*Chanos chanos*)

- Shellfishes like Vannamei (*Litopenaeus vannamei*) and Tiger Shrimp (*Penaeus monodon*)

### ADVANTAGES OF BFT –

- Ecofriendly in nature.
- The technique is to control water quality in aquaculture and its effluent.
- This reduces environmental impact to the fishes.
- Promote to increase the use of land and water
- It reduces water pollution and mitigate the risk of introduction and spread of pathogens while also increasing the fish health.

- Decrease mortality rate, increase larval growth and improve growth rate in the cultured species.
- It reduces the use of protein rich feed and the cost of standard feed.
- The system reduces the pressure on capture fishers that means the use of cheaper food fish and trash fish for fish feed formulation.
- Cost effective feed production.
- It have higher biosecurity.
- This technology enhances the production and productivity by its contribution to the supply of good quality fish juveniles, the latter being one of the most important inputs in the production.
- In relation to the former, the technology could support the supply of good quality seeds by improving the reproductive performance of aquaculture animals and by enhancing the larvae immunity and robustness
- Bioflocs may contribute to the supply of essential nutrients and digestive enzymes either through the stimulation of endogenous production or microbial secretion and the enhancement of nutrient bioavailability that facilitates higher nutrient assimilation.
- Bioflocs also offers a lot of MAMPs (microbial associated molecular patterns), which may be recognized as immunostimulants, resulting in higher resistance to diseases.
- Biofloc system is capable to remove nitrogen in cases of high BOD and presence of organic matter in water.

## IMPLEMENTATION OF THIS TECHNOLOGY FOR AQUACULTURE

Compared to conventional water treatment Technology used in aquaculture biofloc technology provides a more economical alternative i.e decrease of water treatment expense in order of 30%. The efficiency of protein utilization is twice as high in this technology systems when be more than an issue to deal with in the future. The key to minimizing possible negative impacts of climate change on aquaculture end maximising opportunities will be through understanding and promoting a wide range of intensive adaptive new technologies to the farmers such as the biofloc technology combined with greenhouse ponds.

This reduces water treatment expenses for farmers. ... -Biofloc system is capable to remove nitrogen in cases of high BOD and presence of organic matter in water. -Since waste accumulation is reduced, it significantly improves water quality and fish survival rate.

## CONCLUSION

Biofloc technology application offers benefits in improving aquaculture production that could contribute to the achievement of sustainable development goals. This technology could result in higher productivity with less impact to the environment. Furthermore, biofloc systems may be developed and performed in integration with other food production, thus promoting productive integrated systems, aiming at producing more food and feed from the same area of land with fewer input.

The simplified idea of this technique to recycling excreata of aquatic organisms in to feed might frighten the consumers and prohibit them from buying this. Population growth pushes up fish prices. It aims at

maximizing the productivity of fish farming by effectively breaking down of nitrate and ammonia, promoting healthy flocculation and reducing water exchange frequency. Bioflok is one of the best products for achieving sustainable aquaculture goals today and in the future.

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