BIOFLOC TECHNOLOGY FOR IMPROVING WATER QUALITY AND TILAPIA GROWTH THROUGH MUSSEL INTEGRATION

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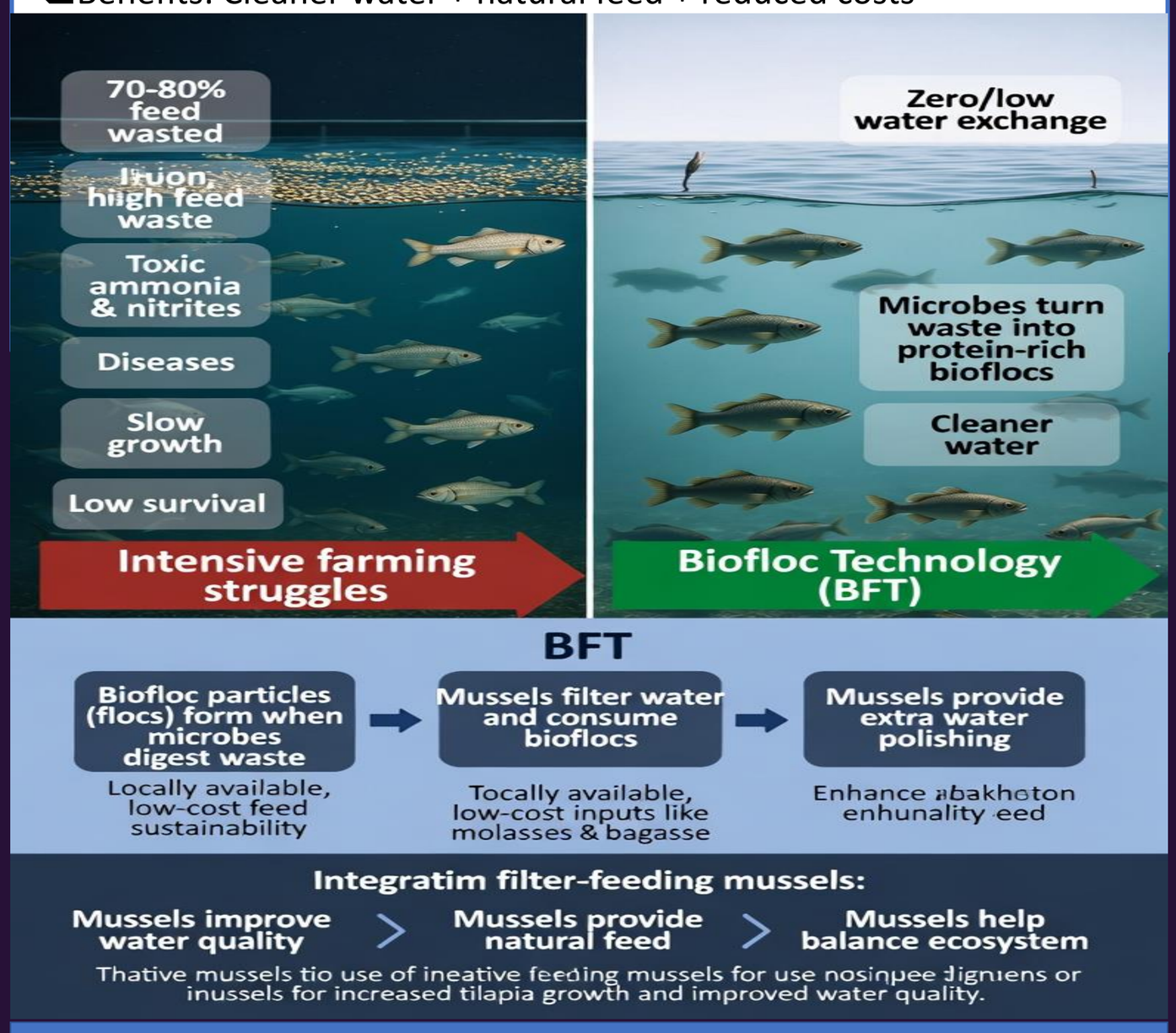
Background

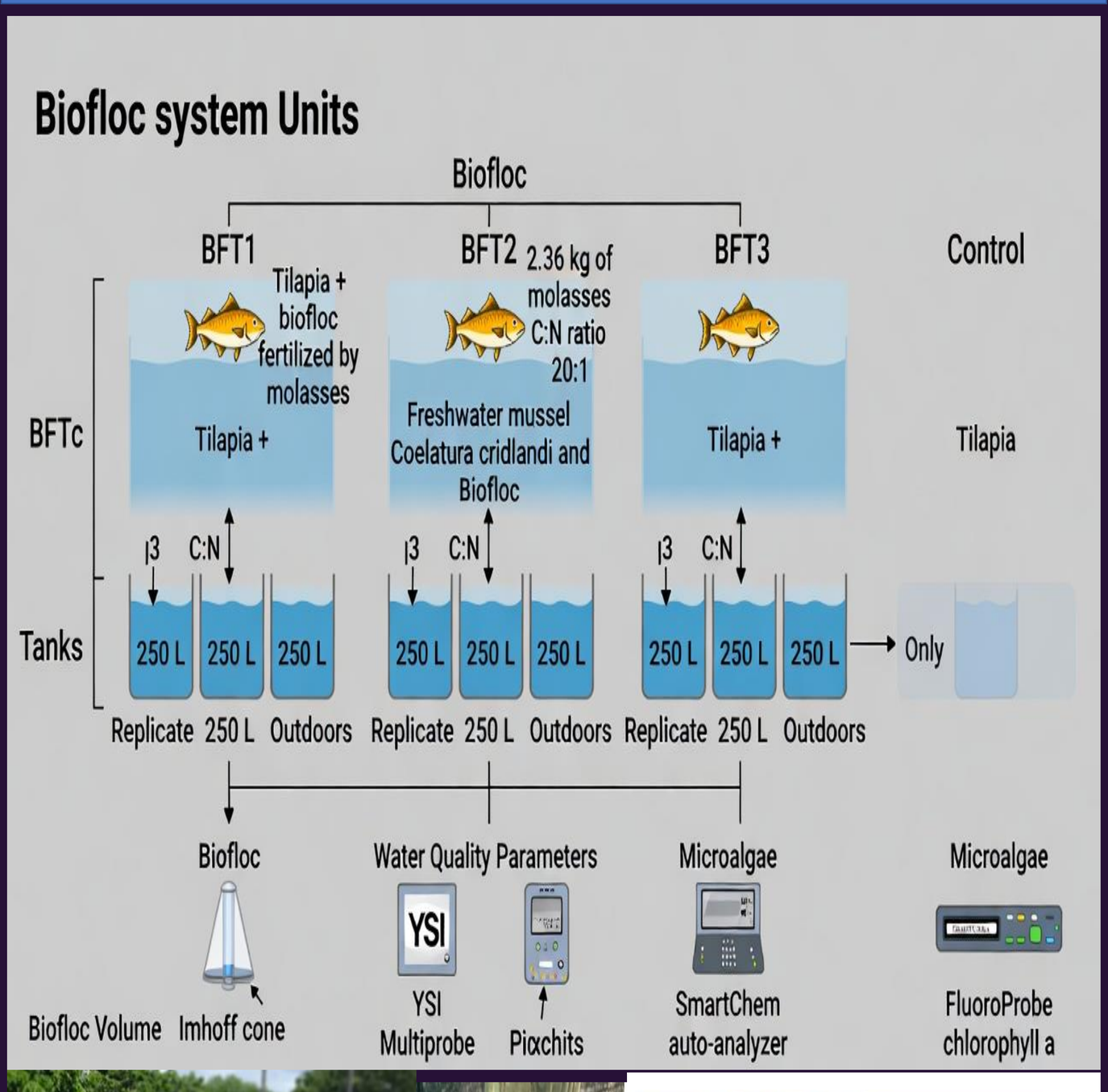
- ❑Problem: Intensive tilapia farming → excess waste + toxic ammonia/nitrite buildup
- ❑Solution: Biofloc technology → microbes + carbon convert waste into protein-rich biofloccs
- ❑Benefits: Cleaner water + natural feed + reduced costs



Aim

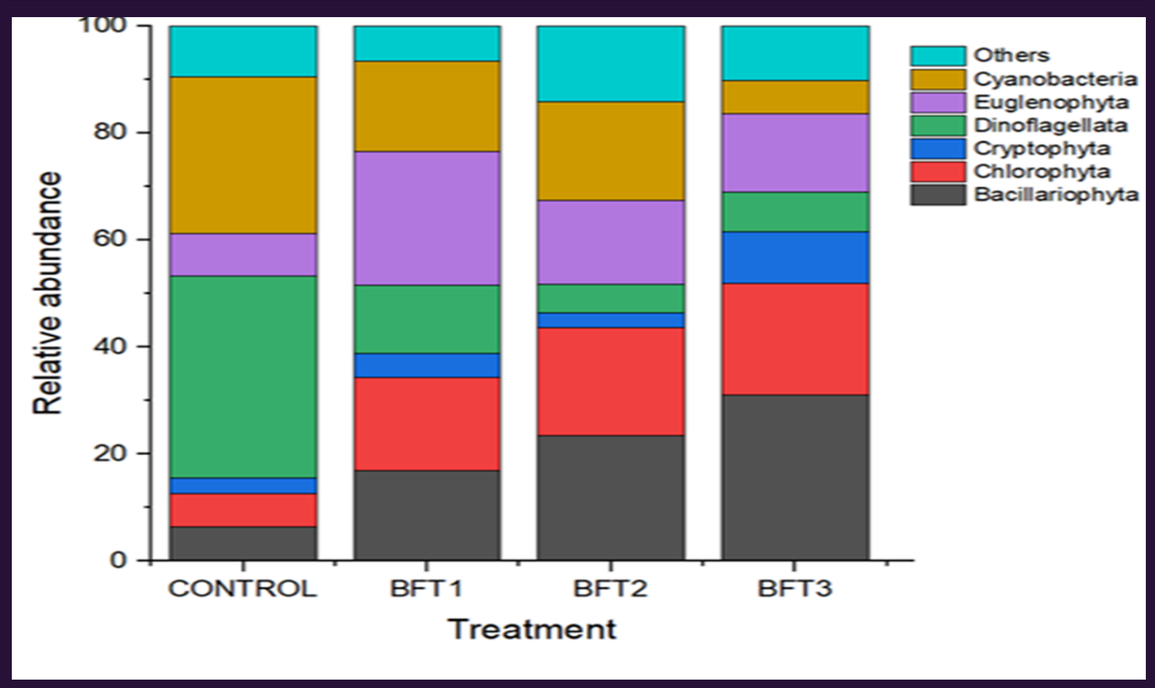
- ❑ Determine nutrient dynamics in a biofloc system integrating Nile tilapia and freshwater mussels
- ❑ Evaluate the effects of mussel integration on water quality and tilapia growth performance in biofloc culture

Methodology



Results/ Discussion

Parameters	Treatment: Control	BFT1	BFT2	BFT3
NO_2^--N	1.93 ±0.55	0.29±0.08	0.17±0.01	0.16±0.03
TAN	1.87±0.70	0.57±0.34	0.50 ±0.20	0.18±0.23
PO_4^{3-}-P	1.49 ±0.58	0.18±0.03	0.23±0.93	0.35±0.10
NO_3^--N	1.45 ±0.13	0.51±0.05	0.15±0.77	0.59±0.56
TP	4.06 ±1.15	0.47±0.19	1.41±0.34	1.10±1.49
TN	4.50 ±1.55	1.74±0.26	10.16±2.60	1.88±0.27
COD	18.01±2.87	15.59±6.21	14.81±4.61	11.39±5.0
WT	29.08±0.24	23.93±0.17	25.43±2.13	27.27±1.26
DO	3.67 ± 0.17	5.64±0.15	6.15±0.36	8.26±1.44
pH	7.28 ± 0.27	8.61±0.08	7.99±32.09	7.45±0.35
chl a	23.87 ±8.51	33.35±13.03	42.09±16.61	52.70±2.7



Diversity indices	Control	BFT1	BFT2	BFT3
Observed species	167.25 ± 20.61[a]	190.56 ± 32.05[a]	217.25 ± 06.61[a]	259.11 ± 24.25[a]
Shannon diversity	5.26 ± 0.12[a]	7.28 ± 0.30[b]	7.26 ± 0.23[b]	7.38 ± 0.66[b]
Evenness	98.02 ± 11.44[a]	111.83 ± 13.29[b]	115.02 ± 11.44[b]	119.65 ± 12.79[b]
Chao1	969.92 ± 407.63[a]	335.27 ± 1249.78[b]	969.92 ± 707.63[b]	650.20 ± 391.69[b]

Discussion

- ❑ Mussel-integrated BFT gave the best water quality (lowest ammonia/nitrite + highest floc volume).
- ❑ Tilapia in BFT3 grew faster and survived better thanks to cleaner water and extra nutrition.
- ❑ Local low-cost inputs (molasses, bagasse, native mussels) make it affordable and scalable for Tanzanian farmers.

Conclusion

- ❑ Mussel-integrated biofloc (BFT3) improved water quality, reduced toxins, and boosted tilapia growth using low-cost local inputs.

Recommendations

- ❑ Scale up on-farm trials in Tanzania
- ❑ Develop affordable portable BFT kits with farmer training

Way Forward

- ❑ Promote mussel + biofloc adoption for sustainable, profitable tilapia farming in resource-limited settings.

Acknowledgment