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The IUCN Global Standard for Nature-based Solutions and Bivalve farming

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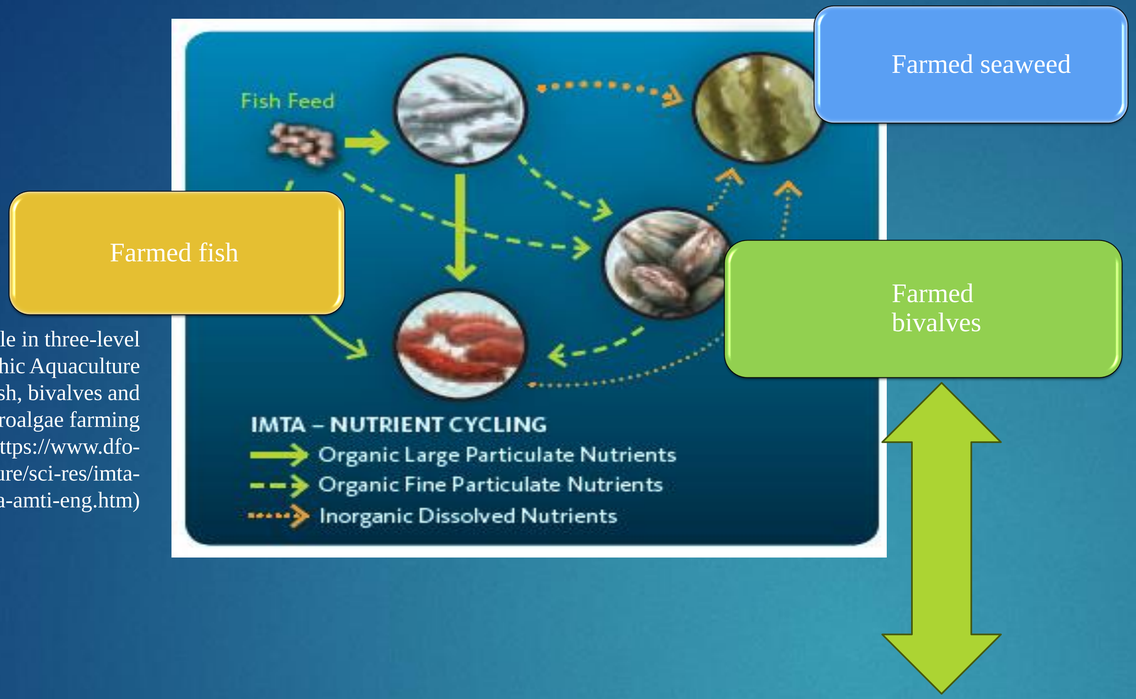

Figure 2a: The nutrient cycle in three-level Integrated Multi-Trophic Aquaculture (IMTA) systems: fish, bivalves and macroalgae farming (source:https://www.dfo-mpo.gc.ca/aquaculture/sci-res/imta-amti/imta-amti-eng.htm)

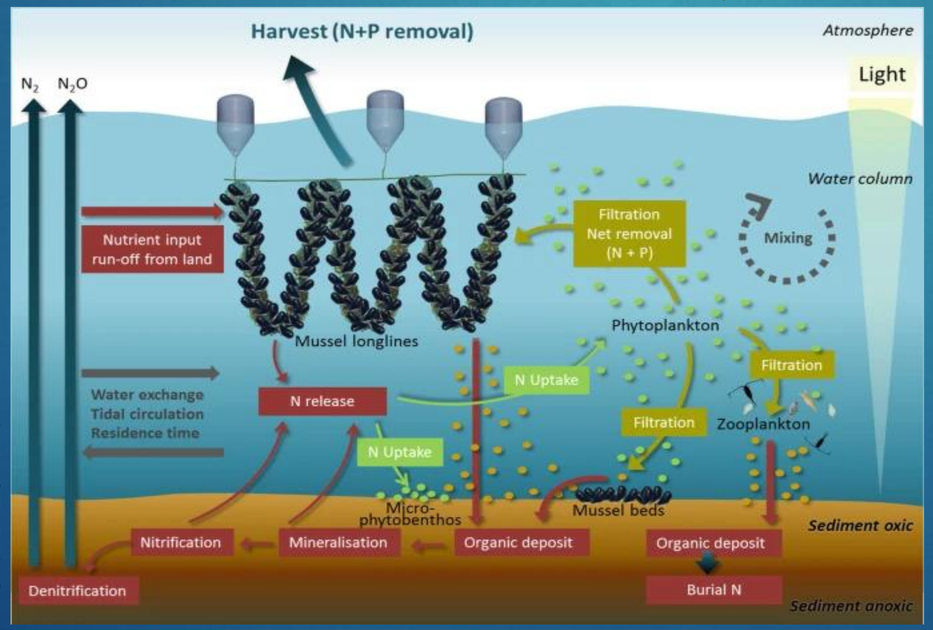

Figure 2b: The role of bivalves in the ecosystem: bivalves filter plankton and suspended matter from the water, helping to remove excess nutrients (nitrogen and phosphorus) from the aquatic environment. By filtering large quantities of water, they reduce the nutrient load that would otherwise contribute to eutrophication (source: https://link.springer.com/chapter/10.1007/978-3-319-96776-9_10:)

INTRODUCTION

The poster shows the integration of the principles of Nature-based Solutions (NbS) in marine aquaculture and the associated benefits. A simple NbS solution used in aquaculture is Integrated Multi-Trophic Aquaculture (IMTA) systems where fish are farmed together with bivalves. Understanding the role of bivalves in nutrient uptake is crucial in order to unterstand the environmental, social and economic benefits of bivalve farming.

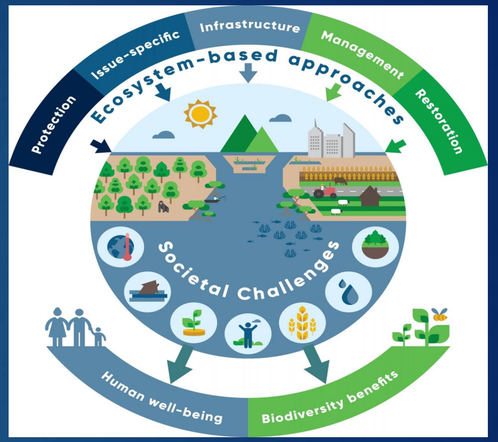

Figure 1: The concept of Nbs in aquaculture (source: IUCN, 2020a)

CONCLUSIONS

The benefits associated with integration of bivalve farming in IMTA systems are numerous, including:

- **Improving Water Quality** - by removing particulate matter and reducing nutrient concentrations, bivalves improve water transparency and contribute to overall water quality.
- **Reducing Eutrophication** - by reducing the concentration of nutrients in the water, bivalves help to prevent the excessive growth of algae, which is one of the main causes of eutrophication.
- **Nutrient Assimilation -** when bivalves are harvested, the nutrients contained in their biomass are removed from the system, effectively reducing the overall nutrient concentration in the water.
- **Carbon Sequestration** – when bivalve shells accumulate on the seafloor, they store carbon that would otherwise be in the water column.
- **Habitat Creation** – by providing shelter and breeding grounds for various marine species, bivalve reefs can provide habitat and increase biodiversity
- **Sustainable Resource Use -** as bivalves rely on natural food sources and require little or no external feed, bivalve farming is a sustainable practise.

REFERENCES

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2. Le Gouvello R, Cohen-Shacham E, Herr D,Spadone A, Simard F and Brugere C. 2023. The IUCN Global Standard for Naturebased Solutions™ as a tool for enhancing the sustainable development of marine aquaculture. Frontiers in Marine Science, Vol. 10:1146637
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