CO-CULTURE OF ATLANTIC SALMON (*SALMO SALAR*), SCALLOP (*PECTEN MAXIMUS*) AND KELP (*ALARIA ESCULENTA*) AT A PILOT SCALE MULTI SPECIES RESEARCH SITE – IMPAQT PROJECT

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Introduction

The EU is the world's largest importer of fisheries and aquaculture products, importing 70% of the EU consumption (EUMOFA, 2018). Change in consumer attitudes has seen a parallel demand in low trophic products such as invertebrates and seaweeds (Barbier, 2019). Aquaculture continues to be a key pillar of future food production systems and there is a drive in aquaculture for sustainability and more circular economies. Strategies such as the European Green Deal, World Ocean Initiative and Sustainable Development of Aquaculture Strategy, also focuses on innovation, integration and the adoption of a multi-sectoral approach, to maximize ecosystem services while providing social and economic benefits.

Integrated Multi Trophic Aquaculture (IMTA) is acknowledged as a promising solution for sustainable development of aquaculture. The concept of IMTA is to farm species of different trophic levels, complementary to each other, so that the wastes and by-products of one species become the feed, fertiliser and energy source for another. As yet, IMTA is not widely adapted at a commercial level. It has been only tested at a very small scale in Europe and the management of large-scale areas remains challenging. Culture of extractive species with fed species in the same aquaculture sites is encouraged, and this practice is shown to remove waste materials from fed species and lower the nutrient load in the water (FAO,2018).

Methodology

IMPAQT aims to promote the eco-intensification of aquaculture by demonstrating the eco-efficiency and minimization of environmental impacts, enabling socio-economic benefits and ecosystem services, and promoting the transition towards a circular economy business model. As part of this several IMTA pilot sites were established across Europe and Asia to examine the impact of a multi species approach to aquaculture and create a platform to develop and deploy novel sensors and smart systems required for long-term autonomous monitoring in the field. Biometric and abiotic data from the pilot sites contributed to advanced IMTA models to examine potential yields, crop quality, circularity, socioeconomic impacts and the interaction of farm components with the environment on the scale of an ecosystem and that can be used for planning decisions by both farmers and regulators.

Results

This IMTA implementation saw the application of two low trophic species to a monoculture finfish facility. The increase in production from the site is discussed using data on biomass accumulation and crop yields to provide expected nutrient uptake rates and value of additional products to the site. The monitoring and management provided datasets to multiple arms of the IMPAQT project.

Work will examine the remediation potential throughout the growing season as well as continued molecular analysis of the crop to establish preferential harvest times dependent on the end product. Importance of increased monitoring to help establish baseline data for decision support systems to achieve better yield, less environmental impacts, less waste.

References

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