“Shellfish industry - A low trophic aquaculture to be boosted: opportunities and constraints"

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Shellfish industry and Integrated Multi-Trophic Aquaculture (IMTA)

Shellfish industry

Value chain with its own economical and structural constraints (similar for fish industry)

Ecological services : a great opportunity to be exploited

- ❖ Carbon sequestration
- ❖ Eutrophication reduction
- ❖ Restocking areas

Highly dependent on environment

Conditions for IMTA

Possible only if economically sustainable

Possible only if ecological services can be accurately evaluated from technical and economical points of view

Possible if environmental and sanitary impacts can be correctly assessed

Multidisciplinary approach

Need for standardized and recognized assessment protocols

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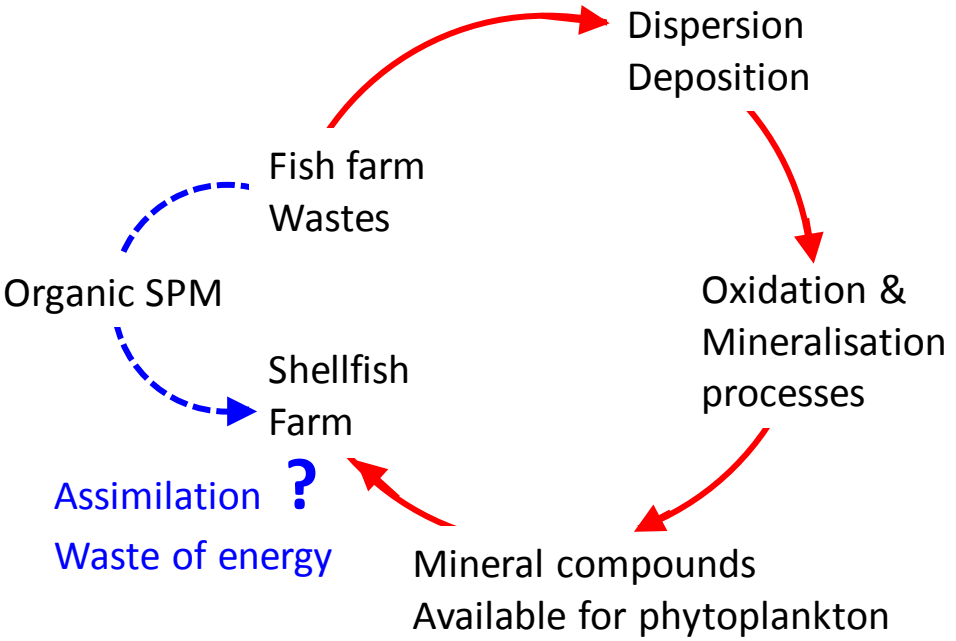

Assimilation of Suspended Particulate Matter (SPM) by shellfish must be studied ?

The probability for a single site to be adapted to fish aquaculture, shellfish aquaculture and seaweeds culture is extremely low.
Sites will be located in different areas and will be “linked” by currents.

In open systems, IMTA does not appear feasible on small scale

Large scale approach
+
Multi-stakeholder approach
+
Multidisciplinary approach
+
Multifactorial approach

Marine Spatial Planning

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Some specific constrains of the shellfish industry to be overcome

Low added value products
Low economical margins for R&D
Low R&D capacities
Problem to anticipate project costs

Mainly SMEs & microenterprises that cannot be directly partner in Horizon projects or similar (UE research instruments not adapted)

No support from feed industry

Low species diversification
Long time is needed to make a new specie or a new production technique able to be developed on large scale

→

Reinforcing the role of producers associations or regional research centres (access to funding)

Promoting a multi-sector approach

Promoting instruments to make easier co-projects between fish industry, feed industry and shellfish industry in a level playing field context

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A great opportunity for shellfish industry → Are ecological services a way to support funding ?

Carbon sequestration →

All the chain must be under control from producer to consumers
Legal framework should be adapted for by-product collecting, stocking, transport and recycling.

Eutrophication reduction →

To be considered an opportunity if current levels are abnormal, but trophic level of the waters cannot be reduced under the historical levels of the traditional shellfish aquaculture areas.
The "Water Framework Directive" (FWD - 2000/60/CE) introduced a scale of theoretical "ecological status" (level of "chlorophyll a" & "TRIX index") where high and good status will not allow to to carry on producing shellfish.
The "Marine Strategy Framework Directive" (MSFD – 2017/848/CE) as the FWD can be considered a threat for shellfish aquaculture.

Restocking areas - Seed recruitment (fouling problem on cages)

Methods	Indicators	Eutrophication status	Eutrophication Range
TRIX[a,b]	$D\%O_2$, DIN (= NO_3^- + NO_2^- + NH_4^+), PO_4^{3-}, Chl-a	High	< 1.6
		Good	1.6–2.8
		Moderate	2.8–4.0
		Poor	4.0–5.3
		Bad	> 5.3
Chl-a biomass classification scheme[c,d]	Chl-a	High	< 0.1 (mg m^{-3})
		Good	0.1–0.4 (mg m^{-3})
		Moderate	0.4–0.6 (mg m^{-3})
		Poor	0.6–2.21 (mg m^{-3})
		Bad	> 2.21 (mg m^{-3})

Conditions not suitable for shellfish aquaculture

Conclusions

Funding system must be thought specifically for :

- Co-project between completely different sectors
- Ecological services recognized and used in the context of the future development strategies
- Long duration projects and continuity in R&D strategies.

Large scale approach :

- Extended geographical area have to be considered
- Multi-sectors approach
- Multi-stakeholder approach
- Multidisciplinary approach
- Multifactorial approach

Assessed and recognized evaluation techniques for ecological services

An healthy, competitive and developing UE aquaculture
is the primary condition for IMTA development
Is this condition currently existing?