



## Producing advanced bio-based fertilizers from fisheries wastes





## The project summary

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The SEA2LAND project is a **4-year collaborative Innovation Action (IA)** funded by the EU in the frame of the Horizon 2020 programme.

Based on the **circular economy model**, SEA2LAND promotes the **production of fertilisers** in the EU from own raw materials. This solution is expected to **reduce the soil nutrient imbalance** in Europe.



**4**  
YEARS

**26**  
PARTNERS

**11**  
COUNTRIES

**+8.8 M€**

**9** TECHNOLOGIES IN **7** DEMONSTRATION PILOTS IN

**6** REPRESENTATIVE AREAS OF THE EUROPEAN FISHERIES SECTOR  
(North, Baltic, Atlantic, Cantabrian, Mediterranean and Adriatic)



The basis of the project is the regional production of bio-based fertilizers (BBF) by developing **demonstration pilots** that can be replicated across Europe, boosting local growth.



The project proposes the implementation of **9 technologies in 7 cases in 6 representative areas of the fisheries sector** (North, Baltic, Atlantic, Cantabrian, Mediterranean, Adriatic Sea).



A person's hand is shown reaching towards a field of crops, likely wheat or corn, under a bright sky. The image is overlaid with a semi-transparent teal rectangular box containing white text. The text is arranged in three paragraphs, discussing the application of technologies to by-products from aquaculture and fisheries, the study of environmental and social impacts, and the potential to replace imported nutrients in Europe.

The technologies will be applied to different by-products from aquaculture and fisheries, and they will produce several BBFs either for local crops and conditions, and others for exporting.

Besides, the effects on soil biodiversity, environmental sustainability and the impact on social parameters and local economy will be studied and business plans will be defined.

Finally BBFs from by-products will serve to partially replace imported nutrients for agriculture in Europe, and, at the same time, contributing to reduce the negative environmental effects of the misuse of by-products.



Improve and adapt nutrient recovery technologies to produce bio-based fertilisers (BBF) from the processing of fish and aquaculture by-products.



Promote fertiliser production in the EU from home-grown raw materials, based on the circular economy model, transforming by-products from aquaculture and fisheries into nutrients for crops.



Contribute to the independence and security of supply of nutrients to European agriculture, reducing the nutrient imbalance in Europe.



## The project objectives

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The **SPECIFIC OBJECTIVES** are:

1. Update and record the intra and interregional nutrient imbalance in Europe, from aquaculture and fisheries.
2. Promote and scale technologies for recovering nutrients from by-products that will enable Europe to substitute synthesis fertilisers by bio-based fertilisers.
3. Obtain BBF that ensure crop production increasing soil fertility and optimize GHG emissions coming from its production.



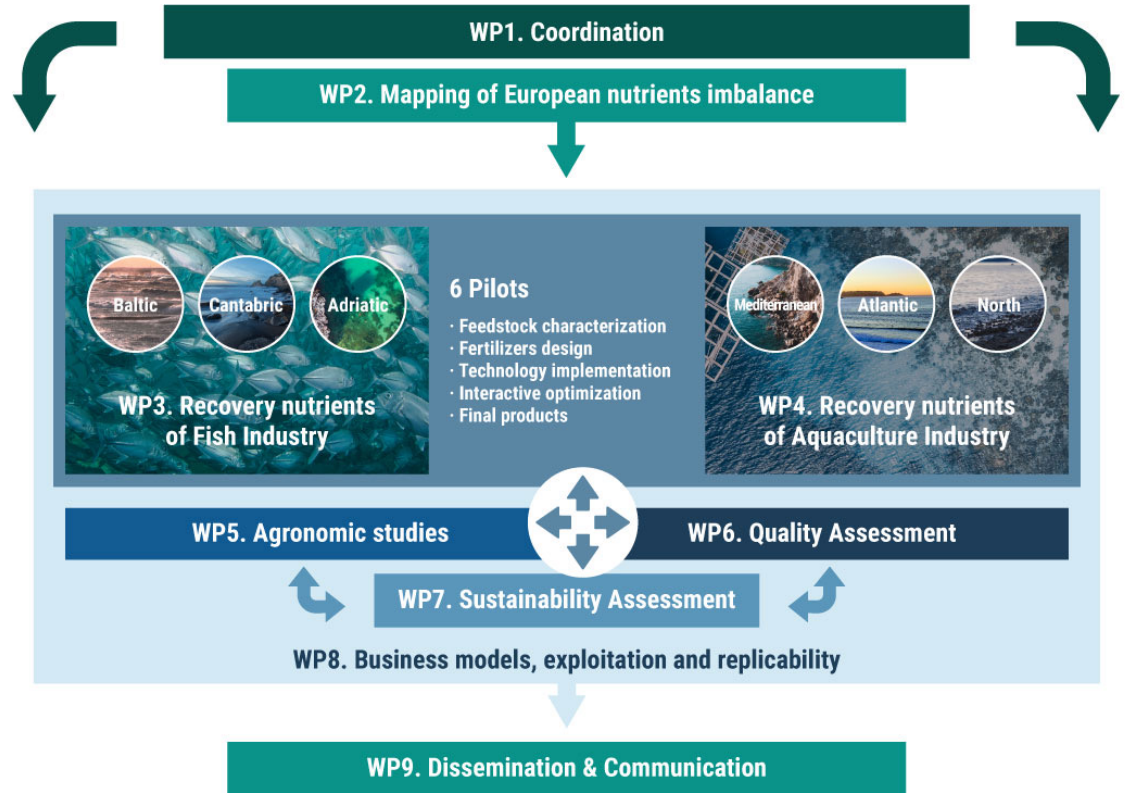


5. Assure the soil quality and health, improving its biodiversity and fertility by these new fertilisers supply increasing biodiversity.
6. Encourage the circular economy and the short chains channels by implementing local and circular business models that will boost rural development and population settlement.
7. Establish the correspondence between geographical, climatological, technological and social conditions and their corresponding business model to design sustainable and circular models based on SEA2LAND obtained experience.
8. Raise awareness in society regarding the recovery of by-products and the use of new bio-based fertilisers and the positive effects on the soil, air and health of the bio-based fertilisers produced.





The project will be implemented through **6 interrelated** Work Packages and **3 horizontal** Work Packages over a period of **48 months**.





# WP1

Ensures sound administrative, financial, and risk management of the project.

## Management and Coordination

# WP9

Dissemination & Communication carries out dissemination activities of the project and its results.

## Dissemination & Communication

# WP10

The objective is to ensure compliance with the 'ethics requirements' set out in this work package.

## Ethics requirements

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## WP2

### **Multi-actor analysis of the requirements of the value chain. Mapping of European nutrient imbalance**

Analysis of the requirements of the different stakeholders involved in the fertilisers production from fisheries and aquaculture by-products value-chain through a multi-actor approach along with the six European pilot areas.

Identification of the areas with excesses or deficits of nutrients.  
Quantify these nutrient imbalances.

Analysis of other side-streams and finding synergies with other ongoing EU projects and initiatives.

## WP3 & 4

### **Recovery nutrients of fish industry and aquaculture industry**

Implement and optimise technologies to recover nutrients from fishery and aquaculture industry by-products.

The work serves to the production of several bio-based fertilisers based on local raw material coming from the aquaculture industry and designed to meet local agricultural needs.

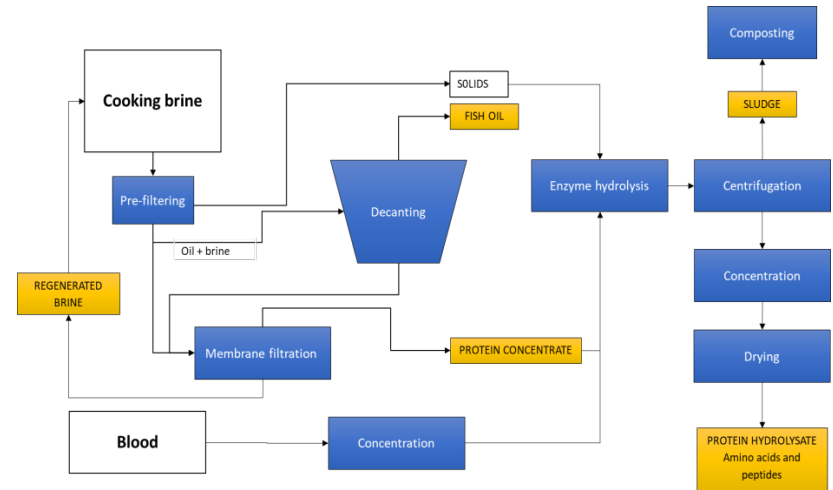
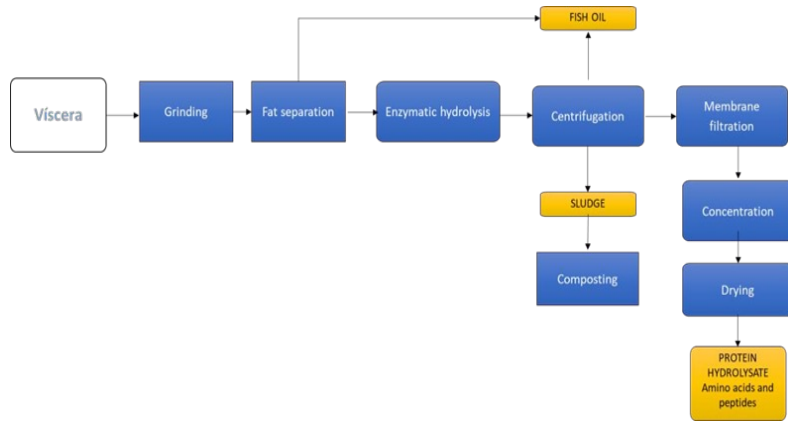


## Technology development for the pilot

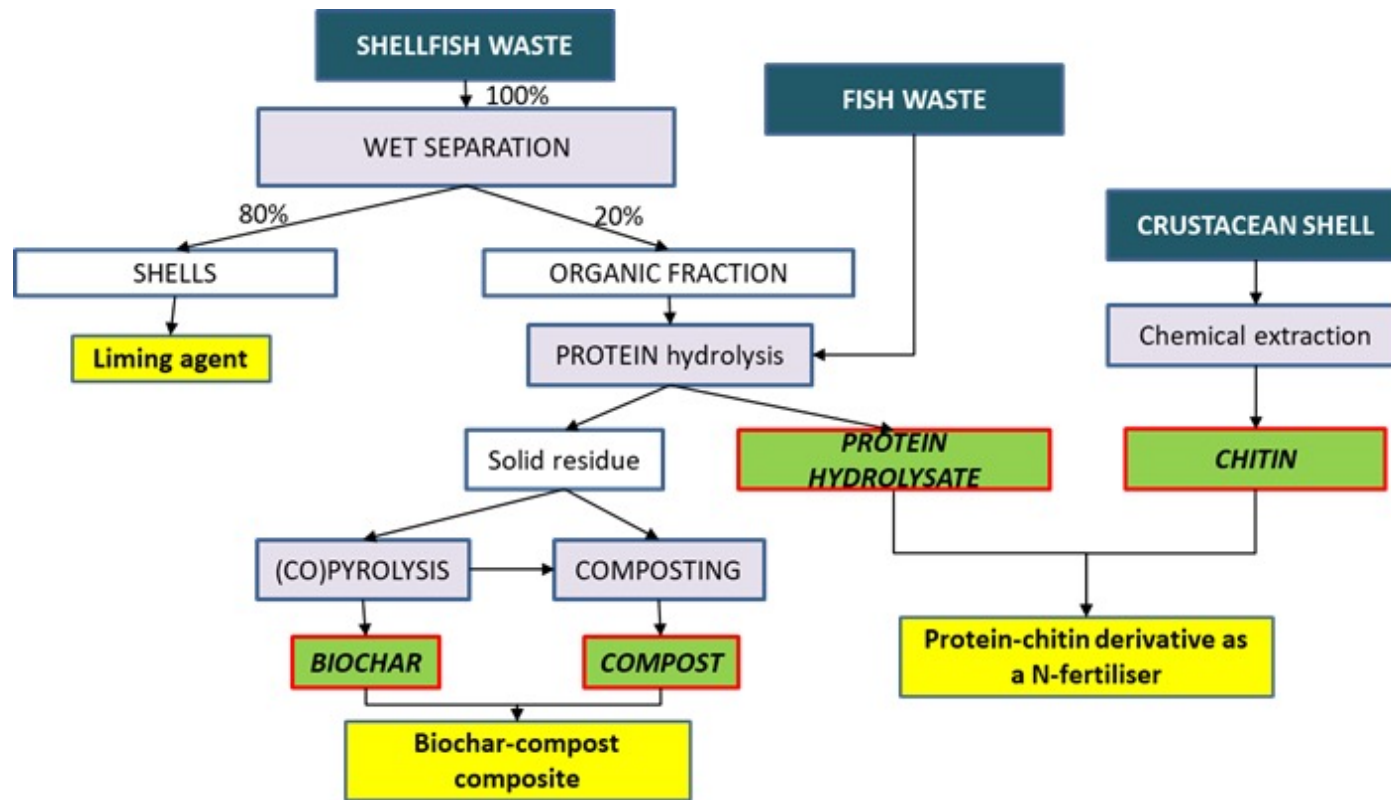
- Pilot fermentation technology building and testing - tumbling barrel bokashi fermentation unit building and integrating with granulation solution
- Vermicomposting unit development and testing
- Intermediate and final fertilizer production for pot testing in 2023 and field testing in 2024 – liquid, granules and vermicompost

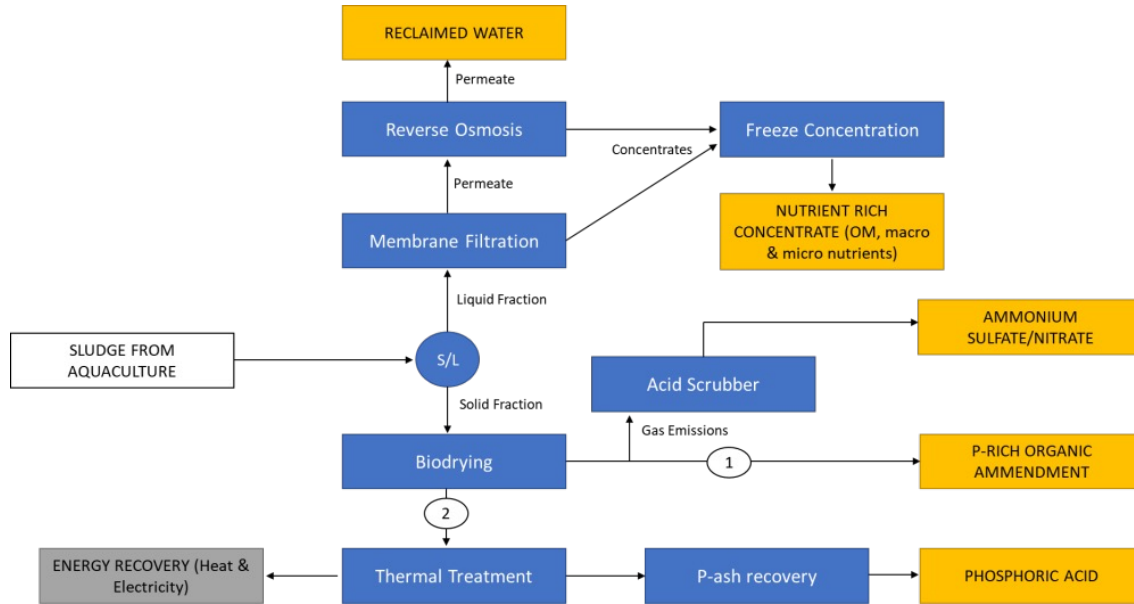


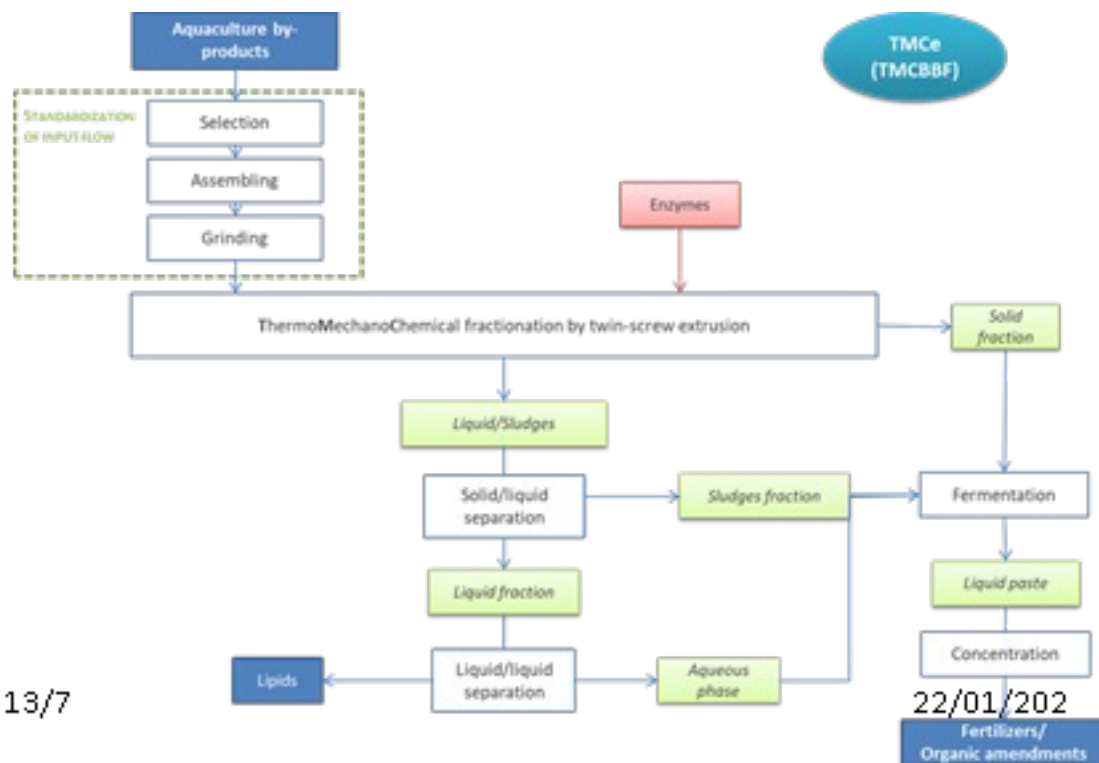




NEIKER will evaluate hydrolysates and side-streams from biorefinery to obtain hydrolysate as inputs in the production of microalgae.

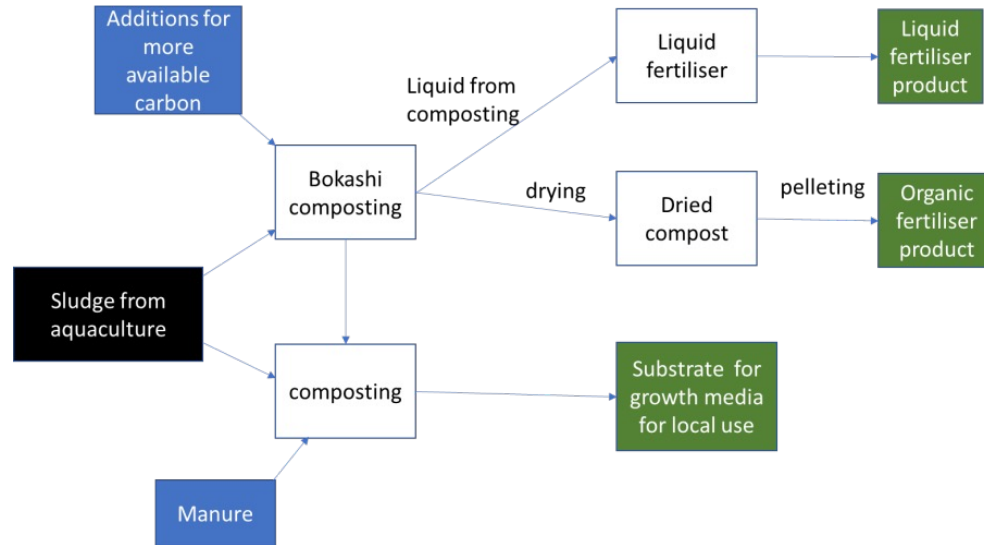






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## WP5

### **Evaluation of agronomic and environmental performance**

Evaluation of bio-based fertiliser's performance, through the study of nutrient mineralisation rates, pH-changes and greenhouse gas emissions in incubation experiments.

Evaluation of nutrient uptake in greenhouse experiments and validation in field trials of the agronomic and environmental performance of bio-based fertilisers under contrasting environmental conditions across Europe.

## WP6

### **Quality and safety assessment of final products**

Assures that the obtained fertilisers accomplish legislation and do not have any harmful effect on human health, soil health, biodiversity, and microflora.



## WP7

### **Sustainability Assessment**

Provides a thorough analysis of the sustainability of fishery-based agronomic interventions by assessing the economic upscalability of BBF production as well as its environmental and socio-economic impacts (Life-Cycle Analysis, Life-Cycle Cost Analysis, Social Life-Cycle Analysis).

## WP8

### **Business models, exploitation and replicability**

Leads to the exploitation of the scientific and commercial results of SEA2LAND. This WP develops business models that can transform semi-industrial solutions into successful business.



The **project consortium** is composed by **26 partners** representing research organisations with experience in:

- valorisation of food industry by-products
- biotechnology
- agronomy and environmental research

Industries from:

- seafood processing
- aquaculture production
- fish by-products valorisation and fertilisers sector







# The project consortium

SEA2LAND



[More information](#)

# SEA2LAND



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