

## Why LIFE MUSCLES?

According to FAO data, mussel production in Italy is estimated to be at about 80,000 tons per year, corresponding to the use of about 700/1000 tons of polypropylene socks, that are replaced at least once during the mussel life cycle.

Being fundamental to mussel farming, the PP socks, however, are one of the most present marine litter on Italy's seafloor, with an annual dispersion accounting for between 7.88 and 9.45 tons.\*

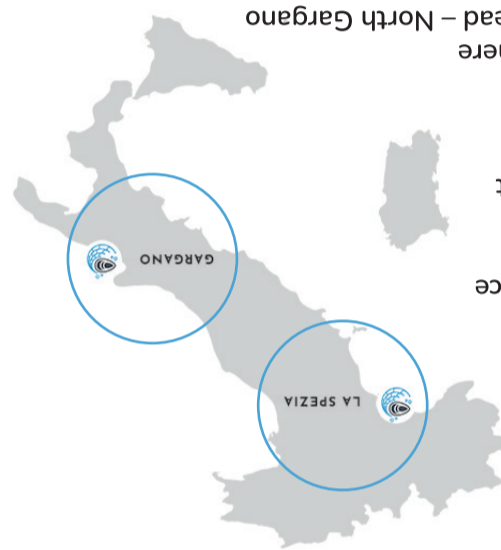
\* (Data from the international project of transnational cooperation, DefFishGear, concentrated in Italy's Adriatic Sea and Ionian Sea).

## > The Project

**Life Mussel Sustainable production (re)cycles**

The aim of LIFE MUSCLES is to reduce the environmental impact caused by the dispersion of the polypropylene (PP) socks used in mussel farming at sea.

There are two pilot areas where the LIFE MUSCLES actions are concentrated, in the Italian zones where mussel farming is the most widespread – North Gargano and the La Spezia area.



The promotion of good practices to be experimented with in Apulia and Liguria, will then be aimed at mussel farmers in other Italian and European areas.

We wish to change mussel farming into a more sustainable and more virtuous practice, introducing a circular supply chain model among mussel farmers essential for the health of our seas and the sector's economy.

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COORDINATING BENEFICIARY



LIFE20 ENV/IT/000570



ASSOCIATED BENEFICIARIES



Ittica Del Giudice  
SOCIETÀ AGRICOLA

Mitilicoltori Associati  
SOCIETÀ COOPERATIVA

**The LIFE Programme** It is the EU's funding instrument for the environment and climate action, created in 1992 to support measures and projects to safeguard our biodiversity and nature, to strengthen environmental policies and raise awareness of environmental issues.

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- Life MUSCLES
- Legambiente Lab
- Legambiente Onlus



# Life MUSCLES

Circular innovation to protect the sea

[www.lifemuscles.eu](http://www.lifemuscles.eu)



## > Specific objectives

- Promote the transition towards a circular economic model for the mussel farming sector through the recovery and recycling of polypropylene socks used in mussel farming.
- Increase the sector's sustainability thanks to the replacement of the PP socks with biodegradable and compostable biopolymer (BP) socks, demonstrating the feasibility of their mechanical and organic recycling.
- Provide mussel farmers with a mobile Recycling Plant able to operate directly at their facilities.
- Classify the recycled materials to ensure their applicability within the mussel farming supply chain and other production chains or sectors.
- Promote the development of new business models amongst the sector's companies.
- Raise the awareness of and inform the key stakeholders (farmers, distributors and consumers) on the sustainability of the mussel production sector. Launch a new brand for muscles produced and packaged with recycled socks.
- Define and transfer good practices to reduce the dispersion and abandoning of the socks at sea.



## > The partners involved and the actions

LIFE MUSCLES contributes to an innovative and circular approach to the ecological transition, thanks to a working group made up of scientific partners, companies in the plastic and bioplastic sector and mussel farming sector.



**Legambiente** coordinates all the project's actions. The campaign concerning information, communication and regional activities through the monitoring of waste, involves citizens, tourists, schools and the key stakeholders such as the mussel farmers, and market and commercial players. It develops and fosters a virtuous circular supply chain also through an identifiable label for mussels produced in the pilot areas and packaged in recycled socks. It also has the task to measure the effectiveness of LIFE MUSCLES in mitigating the threat of the dispersion into the environment from mussel farming and evaluating the achievement of the project's objectives.



**Alma Mater Studiorum of the University of Bologna** works on the specific standards to produce the socks, working with the main public players. This involves the preliminary gathering of data to establish the technological aspects and the procedures of the production system regarding the use of the mussel farming socks. Moreover, it has drawn up a Business Plan to include a technologically developed solution in the market.



**The University "La Sapienza" of Rome**, where the Department of Chemistry has been able to distinguish the physical material features of the sock nets, before and after recovery and recycling, to verify the eventual reuse of the plastic material. This procedure has also been carried out on the biopolymer nets for their mechanical recycling.



**The University of Siena** analyses the water and sea beds and monitors the microplastics that could lead to the disintegration of the socks, in order to check on the presence and impacts on the environment and on the state of health of the farmed mussels. It establishes the best farming methods and the performance of the socks during the different phases of the production cycle.



**Associazione Mediterranea Acquacoltori** (Association of Mediterranean Aquaculture Producers) has the task of ensuring the demonstrative replication of PP sock recycling, promoting solutions designed by the project for the mussel farmers and other Italian regions (Emilia-Romagna, Friuli-Venezia Giulia, Veneto, Apulia, Liguria) and abroad (Croatia and Slovenia), and facilitating the transferring of the mobile recycling plant to these sites.



**Novamont** works on selecting, testing and identifying the most suitable biopolymer in the production of new socks. Working together with the organic waste managers, it also checks on the product's biodegradability carrying out tests that can identify the quality of the compost generated.



**Rom Plastica** is responsible for the PP sock production starting from the recycled socks and of those in biopolymer, as well as the designing, construction and testing of the mobile PP sock recycling plant.



**Cooperativa Mitilicoltori Associati - La Spezia** experiments with the replacement of the traditional PP socks used in mussel farming with the biodegradable and compostable socks.



**Ittica Del Giudice – Gargano** deals with collecting and recycling the PP socks used in mussel farming, to set underway a circular waste management system, closing the production cycle with a maximum waste reduction.