

increase in water retention capacity and a general improvement of all the fertility characteristics. The reconstituted soils have also proven to be suitable for the cultivation of potted plants;

- **Validation of the environmental and economic sustainability of the proposed solutions.** The LCA analysis confirmed that the products obtained have better environmental performances compared to traditional solutions. The business plan demonstrates that it is possible to adopt circular economy models without affecting the profitability of companies;
- **Increased public awareness about the environmental issues faced and the circular economy principle,** thanks to the extensive multi-target communication and dissemination campaign;
- **Increased awareness of authorities and stakeholders operating in the sectors involved** about the presence of legal barriers. An update of the regulatory framework to favour circular and sustainable business has been suggested.

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Beneficiaries



UNIVERSITÀ
DEGLI STUDI
FIRENZE
DAGRI
DIPARTIMENTO DI SCIENZE
E TECNOLOGIE AGRARIE,
ALIMENTARI, AMBIENTALI E FORESTALI

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**Use of dredged sediments for
creating innovative growing
media and technosols for plant
nursery and soil rehabilitation**

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[The LIFE Agrised project]

The main objective of the AGRISED project is to demonstrate the suitability of **dredged sediments**, with no intervention or after co-composting with green waste, to produce reconstituted soils that can be used in the rehabilitation of degraded soils and sustainable substrates for plant nursery. The project is built on the concept of **circular economy**: thanks to the reuse of waste such as sediments and green waste (which often are not adequately valorised, but instead disposed with significant environmental and economic externalities), new eco-sustainable products are obtained. In fact, on the one hand, the AGRISED substrates allow to **reduce the use of traditional peat-based substrates**: peat extraction causes a high environmental impact due to linked emissions and drastic biodiversity reduction deriving from peatland destruction; on the other hand, through its reconstituted soils, AGRISED offers a new solution for the **effective and efficient rehabilitation of degraded soils**.

[The project activities]

During the AGRISED project, the consortium carried out various activities:

- **Analysis of the regulatory framework at national and European level**, to identify any barriers to the circular transition;
- **Validation of the co-composting process** through 2 demonstration trials carried out in different environmental contexts (in Italy and Czechia) starting from locally acquired sediments and green waste. In

each trial, 3 different mixtures were tested, with proportions of sediments and green waste of 3:1, 1:1 and 1:3 respectively by volume;

- **Use of the obtained co-compost for the production of 13 sustainable substrates**, 10 for total substitution of peat and 3 for partial substitution of peat;
- **Use of sediment with no intervention and co-compost obtained for the production of reconstituted soils**, for a total of 7 matrices obtained from the composition in different proportions of sediments, co-compost, waste from the paper sector and degraded soil;
- **Assessment of the agronomic properties of the substrates obtained**, through 3 in-pot cultivation trials (1 autumn cycle in open field, 1 spring cycle in open field, 1 autumn cycle in greenhouse). A total of 580 plants of *Viburnum tinus* and 580 plants of *Photinia x fraseri* Red Robin were grown.
- **Assessment of the pedological properties of the reconstituted soils obtained**, through 1 trial with 18 soil columns and 1 cultivation trial (autumn cycle in open field). A total of 140 plants of *Viburnum tinus* and 140 plants of *Photinia x fraseri* Red Robin were grown during the latter;
- **Assessment of the environmental sustainability**, through a Life Cycle Assessment, and of the **economic sustainability**, through the drafting of a Business Plan, of the AGRISED solutions proposed;
- **Organisation of workshops and technical courses** for transferring knowledge and experience gained during the project.

- **Implementation of a communication and dissemination campaign on national and international scale** aiming at targeting both the general audience and some specific audiences, such as the scientific community and the operators and technicians working in the sectors concerned.
- **Specific communication actions aimed at policy makers and sector stakeholders**, in order to raise awareness on the principle of circular economy and the need for an update of the regulatory framework to favour it.

[The results achieved]

Thanks to the AGRISED project, the following results were obtained:

- **Validation of the co-composting process.** The proposed process has proven to be able to guarantee the complete maturation and stabilization of the compost. In addition to representing a solution for reusing sediments and green waste, co-composting has also proved to be a valid bioremediation technology for sediments, that has shown a reduction in organic contaminant levels;
- **Validation of co-compost-based substrates.** Plants grown on the AGRISED alternative substrates showed similar performances to those grown on traditional peat-based substrates, both in terms of final height and final dry matter;
- **Validation of soils reconstituted using sediments and AGRISED co-composts.** The obtained reconstituted soils showed an evident improvement in their chemical-physical characteristics, with an