

BIOVALOR Project: Forest and agricultural sustainable management to obtain high added value bioproducts to face demographic challenge

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<https://biovalor.es/>

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OBJECTIVES

The main objective of this project is to develop the potential extraction of high added value bioproducts, especially essential oils and extracts, from forest species coming from the application of silvicultural systems on young forest mass, and medicinal and aromatic plants (MAP) grown in agricultural marginal lands with low productivity for traditional crops, in Spain's most depopulated area.

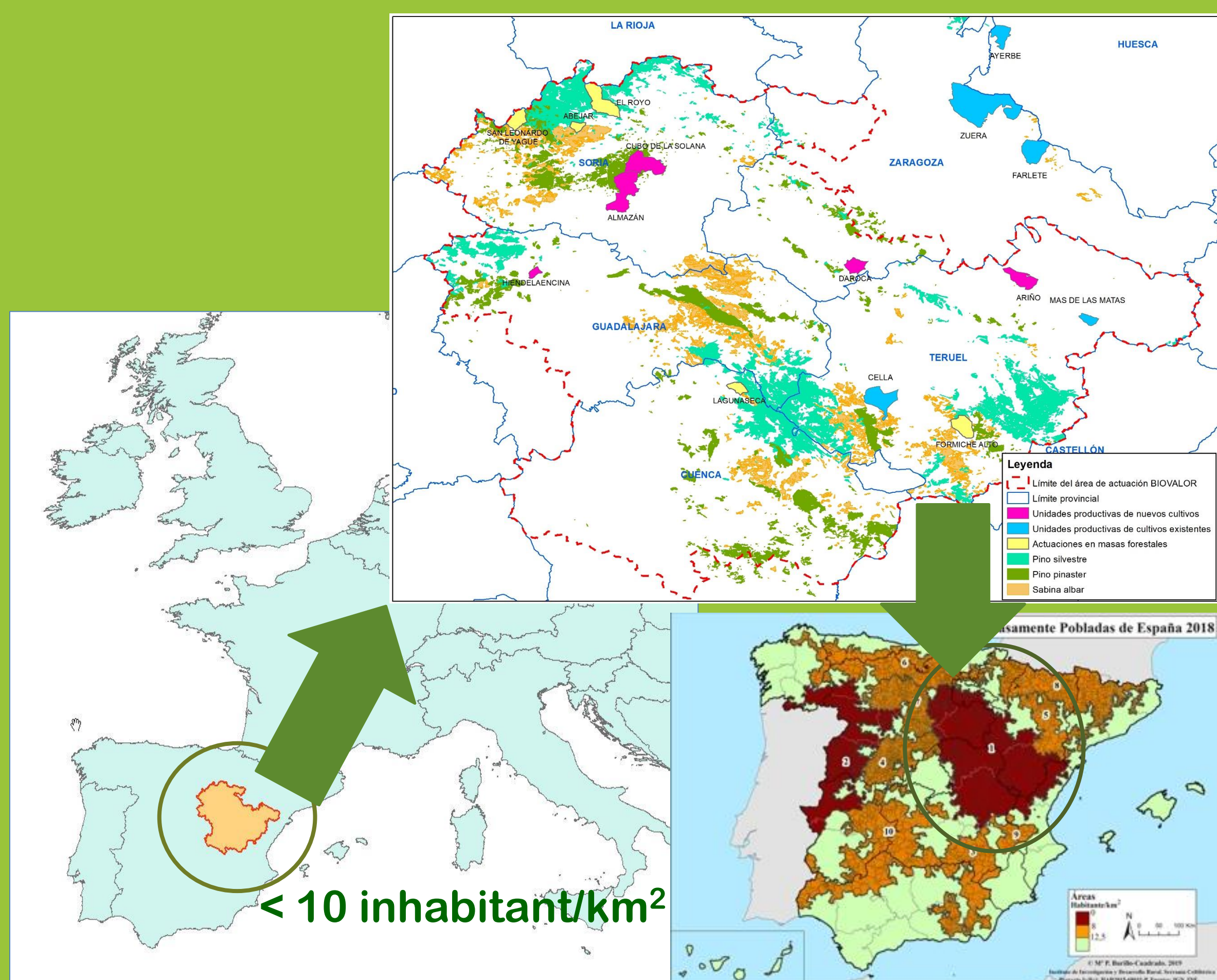
Specific objectives:

- Generation of green employment and promotion of a new productive industry in depopulated areas.
- Increasing the resilience of agroforestry ecosystems facing climate change.
- Development of a new business model based on innovation for the use of pine and juniper forest and cultivation of MAP crops in marginal lands.
- Valorisation of bio-products and by-products of native species.

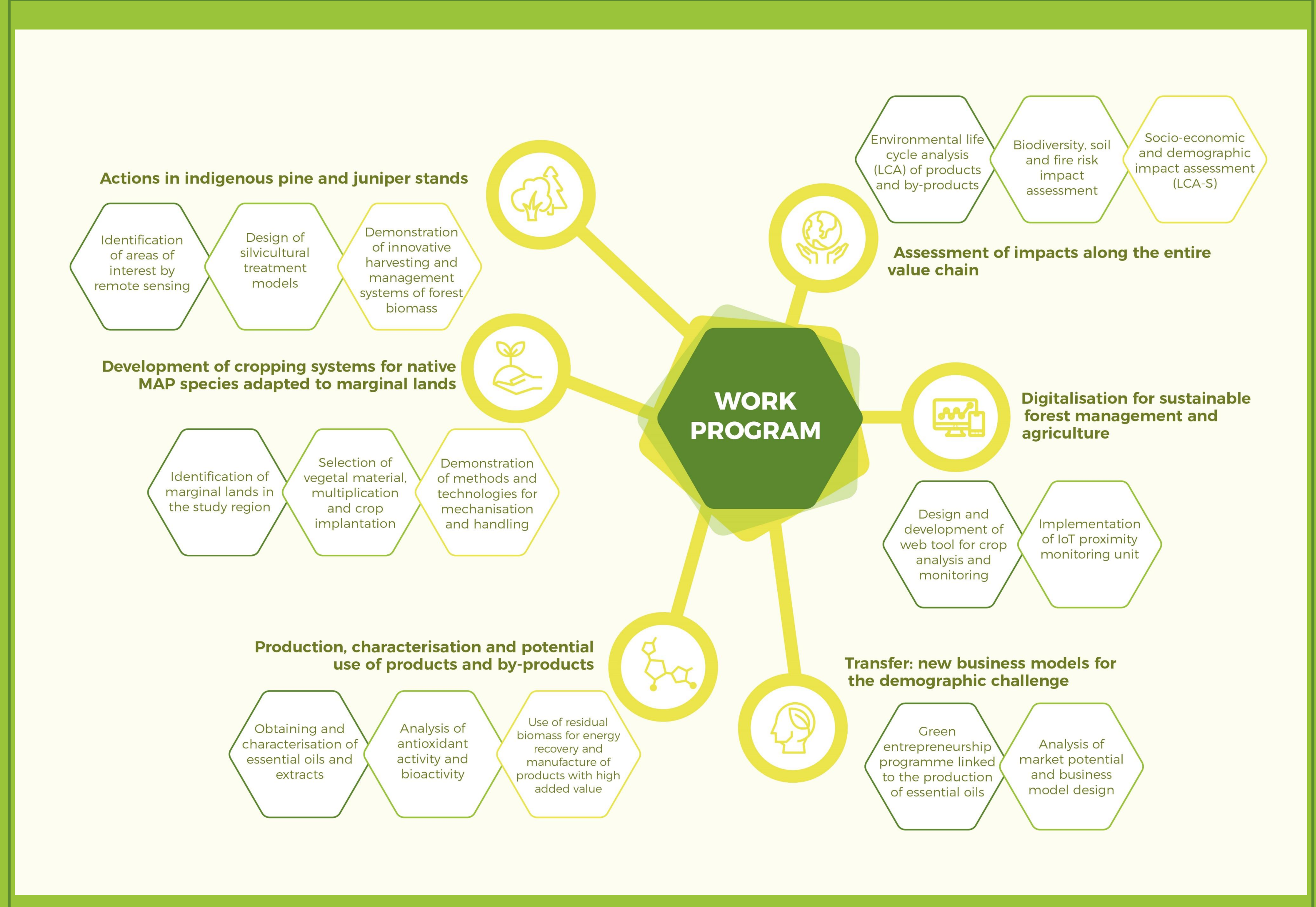
ACTION AREA

The study and action area is among the most depopulated region in the northeast of Spain.

The biomass resources shall bring sustainable solutions to a sector that is confronted to important challenges in the socioeconomic and environmental spheres.



WORK PROGRAM



EXPECTED OUTCOMES

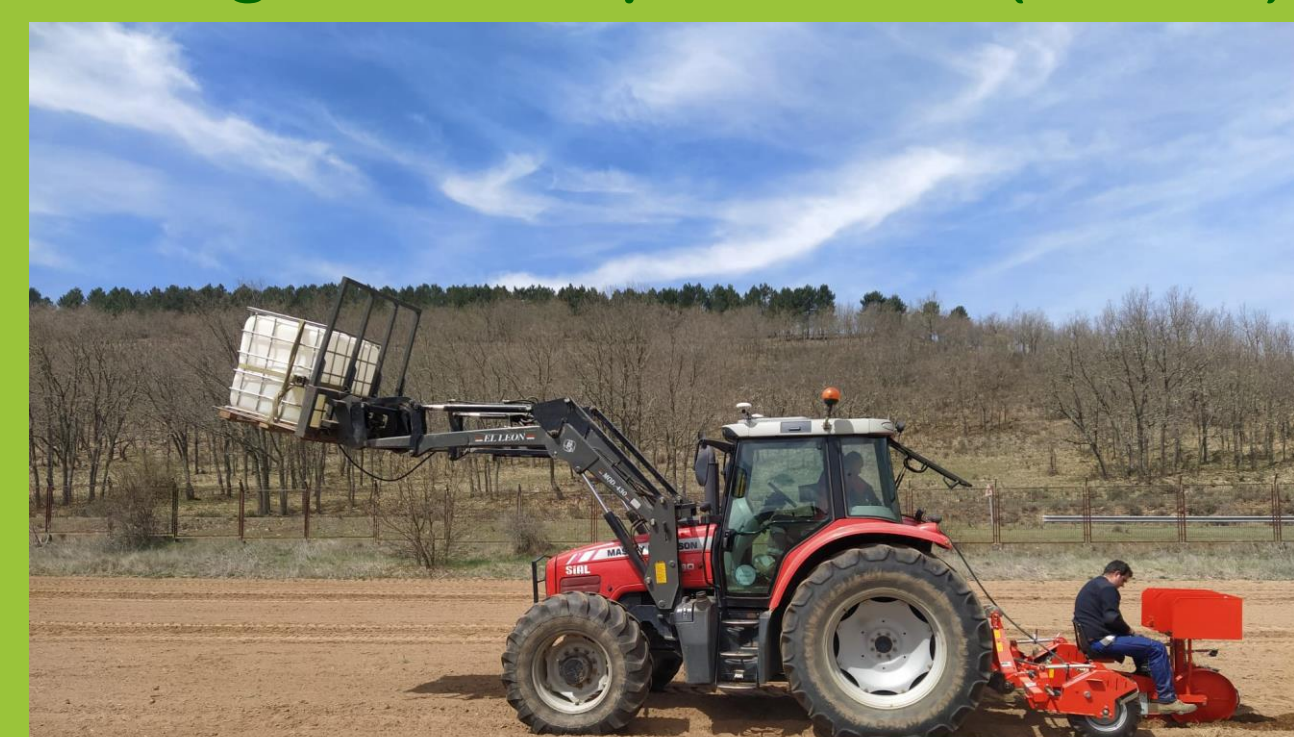
- Identification and treatment of new forest stands to obtain extracts and essential oils, with demonstration of different silvicultural models and specific harvesting technologies.
- Elaboration of sustainable practices guide for MAP crops integrating nature-based solutions.
- Chemical profile products of forest tree species and MAP, with antimicrobial and antioxidant potential.
- Creation and consolidation of new value chains and business models based on obtaining high added value products.
- Modernisation of agroforestry sector by means of mechanisation and digitalisation tools.

ACHIEVED MILESTONES

- 60 ha of pine forest and 30 ha of juniper forest in the area of action identified for silvicultural treatments.
- 4 ha of new MAP crops planted in spring 2023 (Thymus mastichina, Lavandula luisieri, Rosmarinus officinalis). 12 ha of existing MAP crops under monitoring (Origanum vulgare, Thymus vulgaris, Hyssopus officinalis,...).
- Chemical characterisation and bioactivity analysis of essential oils and extracts during the initial plant selection screening and the yield studies depending on harvesting season.
- Established methods for trend assessment of changes in plant, animal, fungal and bacterial communities (biodiversity) in MAP crops.



Silvicultural harvesting (above) and agricultural plantation (bellow)



ENVIRONMENTAL CHALLENGES

- New forest management models to make forest stands more resilient face to climate change and forest fires. Implementation of 1 digital monitoring unit, visualised through a web tool.
- New farming systems to promote biodiversity, reduce erosion and tackle desertification processes. Assessment of organic carbon in topsoil recovery, soil covered by vegetation increase and pollinators appearance.

