

## TIP 9. OBSERVATORY OF ENDOGENOUS RESOURCES



### VIRTUAL DATA INFRASTRUCTURE

**TIP:** Observatory of endogenous resources, virtual infrastructure for decision-making.

**Approximate investment:** 0,5M €

**Expected economic impact:** 0,8M €

#### References:

- Cost-effective, reliable and sustainable feedstock supply chains are crucial to a successful development of biomanufacturing
- A systematic review of comprehensive solution tools to overcome the biomass supply chain (BSC) planning challenges is critical for and industry.
- The lack of standardised definitions makes it difficult to truly assess the volumes of different waste and residue streams that are not currently used but could be reasonably mobilised.

[lleidaterraoportunitats.com](http://lleidaterraoportunitats.com)

### Main objective

To develop and exploit a GIS tool to ease decision making based on the aptitude to grow specific crops and cultivars in each agricultural plot, also assessing the impact of climate change on this aptitude.

### Expected results

The tool shall also integrate spatial aggregation functions to allow large-scale planning and infrastructure development. The project is based on a full-functional pilot developed for the Lleida area in 2022 that includes operational mathematical models that evaluate the aptitude to grow 50 cultivars in nearly 370.000 plots in 32 scenarios (full-factorial combinations of 4 scenarios of temperature, 4 scenarios of precipitation and 2 levels of water use efficiency in irrigation), based on climate (daily), soil, infrastructure (available water, roads) and geographical data, combined with crop requirements (including monthly-based water balances).

The project has two operational levels: general models (public) and on-demand tailored models for specific cultivars, based on private-owned data.

The same tool will integrate the continuous-growing database on bioresources quantification and composition analysis, allowing cross-sector analysis.

### Justification

Decision Support Systems are key for territorial planning. Catalonia has a long tradition of open data (e.g. climate series of up to 30 years, with a very dense public weather stations network, or 1:25,000 soil mapping with detailed agronomic data) that is currently under-exploited, specially when it comes to data combination for strategic purposes.

Quantifying the impact of climate change on agricultural production for each crop and cultivar provides valuable insights for farmers, cooperatives, and the entire agri-food industry. In addition, it also provides useful information to develop future irrigation infrastructure and communications (e.g. when the optimal areas are pushed North).

In terms of exploitation, large agri-food companies that grow specific (premium) cultivars, which also accumulate data from its production and R+D, are interested in hiring the development of specific models that run on such data, which can be partially automated.

### Contribution towards

#### 2035 Goals - AC LLEIDA TERRA D'OPORTUNITATS

Existing data infrastructures and digital tools for decision making.

Technological adoption in the entire primary sector to optimize productivity and efficiency in the use of resources.

Adaptation of crops to climate impacts and food trends.

Attractive sector for youth.

#### SDG

Directly

Indirectly



#### Shared vision 2050 - AC LLEIDA TERRA D'OPORTUNITATS

**Economic Development:** The tool ensures long-term agricultural production in different climate scenarios, avoiding unexpected impacts and securing farming jobs.

**Sustainability:** The DSS allows adapting the agricultural production to the climate conditions (e.g.: allows anticipating the need for changing crops due to water scarcity in different watersheds and irrigation districts). **Education and Workforce Development:** Digital tools can be used for new generations of farmers, which can be trained through the public version. **Transformative**

**Innovation Ecosystem:** The development and continuous improving of the DSS needs inputs from multiple perspectives, from R&D in new cultivars to climate and soil analysis, including collaboration in the multiple uses for infrastructure development.

**Improved Quality of Life:** Securing the sustainability of the main economic sector of the territory strengthens the basis for the development of the new, complementary value chains, and paves the way for digital agriculture since the planning phase.

#### NICHES

