

## AGRICOOOP BIGDATA: intelligent processing of useful data in the production processes of cooperatives

### Summary

The aim is to produce intelligent reports, comparisons and forecasts for the cooperative sector to improve its decision-making. This will be achieved by an advanced analysis of the annual data generated based on Single Agricultural Statements (DUN) using machine learning and knowledge discovery methodologies. This will entail the design, definition and validation of a Cloud platform integrating this data, these models and these reports with other public databases that complement this information in a non-relational environment (Big Data) that can be used for strategic decision-making.

### Objectives

- a. Establish the main indicators for descriptive analysis of the data included in the DUN, and assessment of the quality of the information it provides (detection and quantification of errors). Segmentation of indicators according to the interests of producers and other decision-makers.
- b. Propose an intelligent predictive model to support strategic decisions for producers, agricultural cooperatives which are members of the DUN–FCAC group, and the Federation itself.
- c. Define an Agricoop–BigData platform that integrates DUN data with its histories, the Spanish Agricultural Plots Geographical Information System (SIGPAC) as a mapping medium for locating producers and cooperatives, and other public or private databases which the FCAC and its partners can access and which can be added to the SIGPAC as additional layers.
- d. Apply innovative Big Data methods to analyse and exploit data from the Agricoop–BigData platform, in order to extract and display useful information for the recipient organisations, and perform the pilot tests necessary to validate it.
- e. Design an innovative system for anticipating and estimating future developments (forecasting) in the economic, social and environmental dimensions of the members of each cooperative in the DUN–FCAC group, in order to assess and predict the sustainability of the system.
- f. Analyse the various levels of confidentiality of the data and its exploitation, while complying scrupulously with the provisions of applicable data protection legislation.
- g. Study the creation of new business models to produce new services aimed at facilitating decisions for farm managers, cooperative managers and their representative organisation.

### Description of the measures planned in the project

1. Analysis of main indicators in the DUN.  
Analysis of DUN campaign data.
2. Predictive model for strategic decisions  
Analysis of historical DUN data to identify strategic decisions at economic, social and environmental levels

3. Define an Agricoop–BigData platform

Integrating data from various sources and with different frequencies: DUN, SIGPAC, public agricultural statistics databases and FCAC private databases\_

4. Application of innovative BigData methods

Analysis of the appropriate methods for the exploitation of data so that useful information for its users can be extracted and displayed.

5. Design of scenarios and production alternatives.

Proposal for an innovative system for estimating future developments (forecasting) in production activities based on the data accumulated in the DUN and considering different production scenarios. Statistical techniques will be combined with machine learning techniques.

6. Implementation of an SaS platform.7. Dissemination of the results

### Expected results and practical recommendations

The main result anticipated as a result of the project is an intelligent expert system (Agricoop–BigData) that enables quantitative and qualitative analysis of the historical data that have accumulated over the years in the DUN databases, in order to be able to undertake a prospective analysis of the future based on various scenarios.

This system (Agricoop–BigData), based on techniques involving handling large volumes of data with advanced mathematical and statistical knowledge, will provide valuable information for decision-making in various areas of the cooperative agrifood sector, ranging from individual answers for each member, strategic information for each cooperative and, at the highest level, information for the sectoral organisation that represents them.

The system will analyse the information, systematise it, order it and be able to generate summarised reports which provide this strategic information under the supervision of trained human resources.

The entire system will converge by generating high value reports that enable the analysis of information and strategic decision-making based on reliable data generated in the cooperatives themselves, and which enable new services to be implemented.

Finally, it is anticipated that the project will enable Catalan agricultural cooperatives and their members to make a qualitative leap, by using this information to improve their decisions at both the individual farm level and at the cooperative level. This qualitative leap must also lead to greater integration of cooperatives in the research field, and enhance relations with one of the country's leading universities in the field of agrifood, promoting collaboration in future projects.

### Leader of the Operational Group

ORGANISATION: CATALAN FEDERATION OF AGRICULTURAL COOPERATIVES (FCAC)

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### Other members of the Operational Group (not recipients of the grant)

ORGANISATION: UNIVERSITY OF LLEIDA

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**Subject area(s) of application**

- Agricultural production system
- Agricultural practice
- Agricultural equipment and machinery
- Livestock farming and animal welfare
- Vegetable production and horticulture
- Landscape / Territorial management
- Pest and disease control
- Fertilisation and nutrient management
- Soil management
- Genetic resources
- Forestry
- Water management
- Climate and Climate Change
- Energy management
- Waste and by-product management
- Biodiversity and environmental management
- Food quality/processing and nutrition
- Supply chain, marketing and consumption
- Competitiveness and agricultural and forestry diversification
- GENERAL

**Geographical area(s) of application**

PROVINCE(S)	REGION(S)
CATALONIA	ALL

**Dissemination of the project (publications, seminars, multimedia, etc.)**

Dissemination material, FCAC website [www.fcac.coop](http://www.fcac.coop); Agroactivitat Magazine, DUN seminars, FCAC circulars. UdL website <http://www.udl.cat>; News. Workshop. Others

**More information on the project**

PROJECT DATES	TOTAL BUDGET
Start date (month-year): July 2019	Total budget: €140,800.00
Completion date (month-year):	DARP funding: €56,179.20
Current status: Underway	EU funding: €42,380.80
	Own funding: €42,240.00

## With funding from:

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Order ARP/133/2017 of 21 June, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ARP/1282/2018, of 8 June announcing the call for the grant.



Generalitat de Catalunya  
**Departament d'Agricultura,  
Ramaderia, Pesca i Alimentació**



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