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### Introduction

LIFE CLIMAGRI project (LIFE13 ENV/ES/000541) proposed a set of Best Management Practices (BMPs) for the improvement of the environmental conditions of farms in the Mediterranean area. These BMPs include the three principles of Conservation Agriculture as well as other practices related to the optimization in the use of inputs, to the use of advanced technology or to the promotion of biodiversity.

### Monitoring of the BMPs

For the monitoring of the aforementioned BMPs a series of indicators (25) were proposed. Since the calculation of the indicators is linked to a particular plot, the project uses a GIS platform in order to geo-reference the info provided and obtained (Figure 1). Calculations are based on info made available by the user (Figure 2), who must provide all data related to the crop management and inputs used (fertilizers, plant protection products, water, etc.), as well as reply to a questionnaire on which both technical and personal perception questions are asked. Additionally, although not necessary for the calculation of the indicators, the platform allows to conduct a self-evaluation of the level of fulfilment of the recommended BMPs.



Figure 1. Values of Climagri indicators are geo-referenced

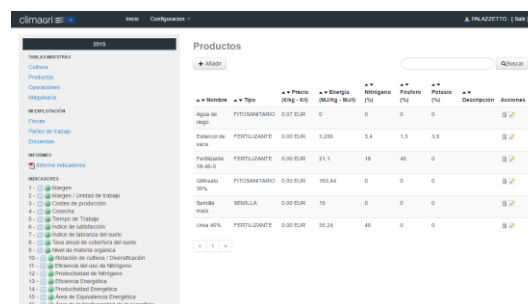


Figure 2. The user provides info on the basis of which indicators are calculated

Taking into account all the supplied info, the output provided by the GIS-Platform is a report on which the values for the indicators are shown and, in case the self-evaluation questionnaire has been filled in, a series of recommendations about the BMPs on which emphasis should be placed upon in order to improve the sustainability of the plot.

### Adaptation of the platform to be used in olive groves

As the project was focussed in annual irrigated crops, some of the indicators are not suitable to be calculated in olive orchards. Nevertheless, olive is one of the main crops in the Mediterranean area, particularly in the Andalusian region, where, according to data provided by the Spanish Statistics National Institute (2016), more than one third of the agricultural area is dedicated to this crop. This makes it very much worthwhile to adapt the platform, so that indicators can be calculated and recommendations can be provided for this crop.

To this end, it is necessary to allow a selection between "Annual crop" and "Perennial crop" before starting to include the farms information which feed the system. This means that the platform should be duplicated and, for the case of the "Perennial crop" the algorithms for the calculation of some indicators should be re-formulated. The following table (Table 1) shows the list of indicators and the background colour of the cell indicates whether any modification is needed in order to be used in olive groves:

Table 1. List of indicators and level of adjustment for their use in olive groves. Green: No modification is needed; Orange: It needs minor modifications; Red: It needs deep modifications

Indicator Number	Denomination
1	Margin
2	Margin/Work unit
3	Production costs
4	Yield
5	Working time
6	Satisfaction index
7	Soil tillage index
8	Annual soil cover index
9	Organic Matter level
10	Crops rotation/Diversification
11	Nitrogen use efficiency
12	Nitrogen productivity
13	Energetic Efficiency
14	Energetic Productivity
15	Energetic Equivalent Area
16	Biodiversity Areas
17	Ratio Natural vegetation area/Total area
18	Connection to environmental networks
19	Biodiversity structures
20	Use of PPPs close to water streams
21	Greenhouse gases level
22	Erosion risk
23	Fuel consumption
24	Irrigation efficiency
25	Escape and resilience

### Expected results

The continuous monitoring of the BMPs carried out to the farms included in the CLIMAGRI project through the calculation of the indicators in the GIS platform contributed to an average increase of the implementation of the BMPs of 30%. Based on this experience, similar results can be expected to be achieved in the olive groves of the Mediterranean area thanks to the improvement of this very useful tool.