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CIHEAM

2nd Mediterranean Forum for PhD Students and Young Researchers

Research and Innovation as Tools for Sustainable
Agriculture, Food and Nutrition Security



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With the technical
collaboration of



Food and Agriculture
Organization of the
United Nations

AN INTEGRATED DECISION SUPPORT TOOL FOR ECO-EFFICIENCY ASSESSMENT OF AGRICULTURAL PRODUCTION

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Relevance of the Research

There is significant scope and pressure to make agricultural production systems more sustainable, however, farmers generally lack adequate assistance to develop and adopt better approaches for environmental sustainability, while also maintaining their financial and social objectives (Levidow et al., 2014).

Simple, timely, user-friendly, free-of-charge Multi-criteria DSS tools are needed able to help researchers to obtain environmental and cost-benefit assessments of daily practices and adoption of innovative technologies in terms of their holistic contribution to eco-efficiency improvements.

A innovative simulation-based decision support (**BLULEAF EVOLVE**) is developed to evaluate agronomic, environmental and economic aspects of farm systems using a life cycle thinking approach.

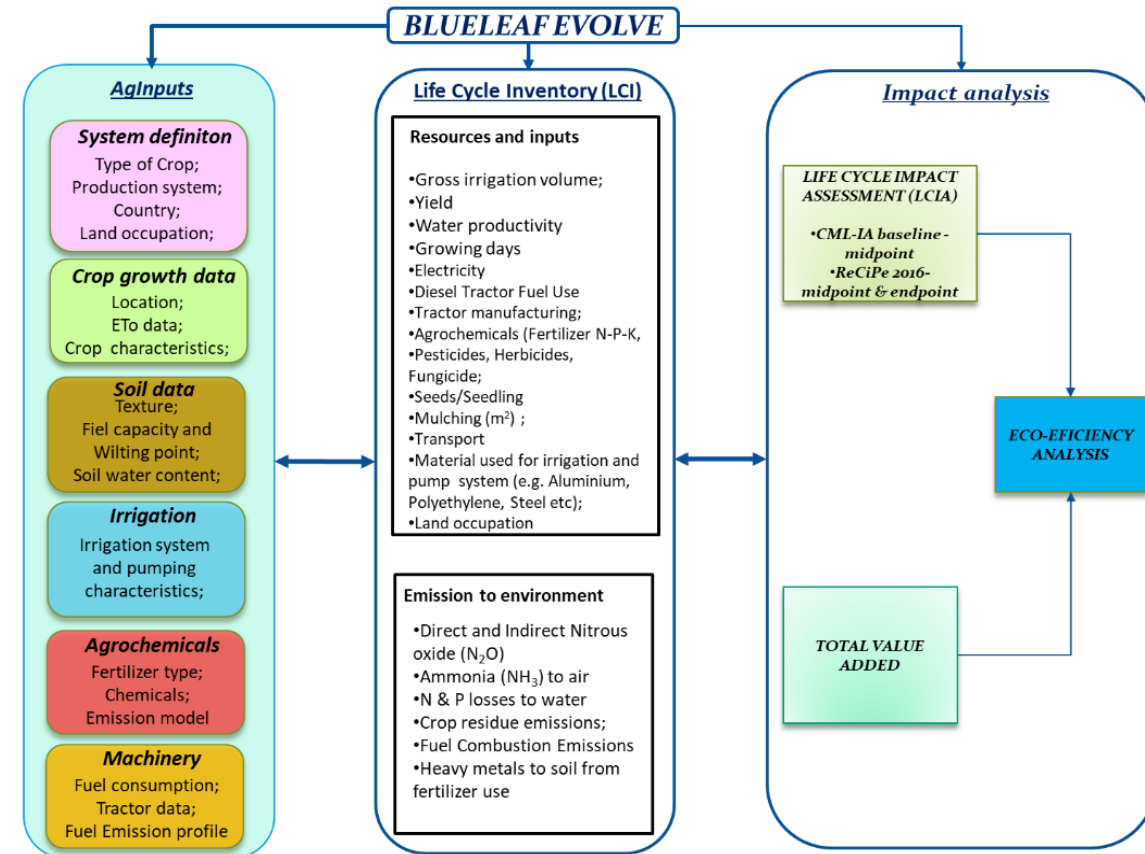
The tool integrates a **soil-water balance model** (weather and reference evapotranspiration model + daily soil water balance model), the **resource requirement model**, **environmental LCA model** and **economic models** into one comprehensive database model.



Main Results

By using this tool all the target stakeholders can:

- Calculate reference crop evapotranspiration, and soil water balance components using different equations;
- Compile all agricultural inputs and outputs in terms of resources from the environment and emissions to different compartments;
- Create an extended 'environmental profile' using 30 indicators.
- Total Value Added to the product due to water use and adopted management practices).
- Monitoring of crop and system performance from one year to another with a special focus on environmental sustainability;



Impact and Prospectum

The research is of **great contemporary academic significance** that would be of added value for farmers, water user associations and environmental agencies, agricultural researchers to measurement crop water requirements, irrigation water balance and system analysis, and eco-efficiency analysis of farm systems.

The tool provide a **new integrated vision of agricultural production** and quantified indicators of the sustainability performance, from cradle to grave. A multi-impact analysis from complementary angles, i.e. addressing environmental, economic and social impacts could support the stakeholders and policy-makers to analyze the agricultural water systems and to identify the best management strategies towards mutual interests and better eco-efficiency performances (Todorovic et al., 2016)

By increasing the exchange of knowledge and influence mediation among farmers, researchers and other stakeholders, their **'capacity to innovate'** and contribute to the **'scaling of innovations'** is enhanced (Hermans et al., 2017).



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Thank You

Get in Touch

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