

# INTEGRATED PROCEDURES FOR EVALUATING TECHNICAL, ENVIRONMENTAL AND ECONOMICAL ASPECTS IN FARMS: THE SIPEAA PROJECT

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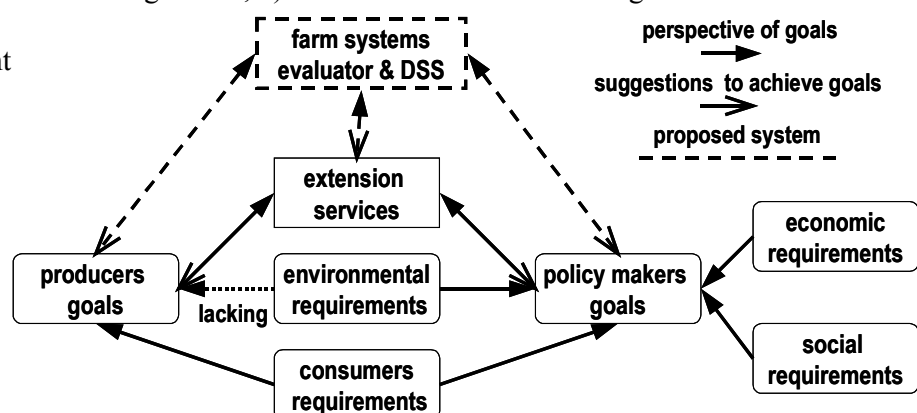
## Introduction

The often contrasting and evolving goals between producers and policy makers to satisfy consumer, ecologic, economic and social requirements that have increased in recent history, requires the evaluation of agricultural systems with an equally adaptable perspective. Producers have long term intimate knowledge about the effect of production factors on yield in their environment, but often lack knowledge about the ecological effects of their systems. Farmers may have mastery of the management options in order to achieve both yield stability and profitability in slow changing systems, but often lack information needed to adapt to fast changing regulations and/or environmental conditions. From the policy makers' perspective, the wide variability of environments, agricultural practices, economic and social constraints have frequently demonstrated that there is no unique package of solutions to achieve the expectation of both producers and consumers. Policy makers would benefit by tools designed to evaluate a broad range of complex scenarios to produce regulations that would define the parameters for production techniques that would effectively satisfy the requirements of their constituency. In many situations, extension services are ready to provide assistance on specific aspects of crop management, but they are not properly equipped to help producers adjust their agricultural systems to accommodate the at times substantial changes needed to cope with new regulations. In recent decades significant advances have been made in the development of computer based tools and particularly computer simulation models for application to agricultural systems (Stöckle, 1999) and may provide an effective way to bring the agricultural policy and production goal perspectives into resolution. Both interdisciplinary integration and the subsequent development of operational tools has several challenges for further progress. Integrating well documented models which refer to different domains of the farming system would provide an approach to evaluate agriculture management strategies accounting the wide variety of goals and constraints in many countries.

## The project SIPEAA

The first term (2002-2004) of the SIPEAA project (Software Tools for Eco-compatible Farm Planning) has commenced. Supported by the Italian Ministry of Agricultural and Forestry Policies (MiPAF), this project aims to quantify and integrate the major components (i.e. technical, economical, environmental) that influence the decision process in overall farm design. The principle goals are: 1) to provide extension services with tools for integrated analysis to help farmers adhere to environmental regulation, 2) to increase the understanding of the environmental impact associated with alternative management

ensuring sound environmental policy, 3) to identify solutions adaptive to changing conditions that optimize farmers income while minimizing environmental impact,

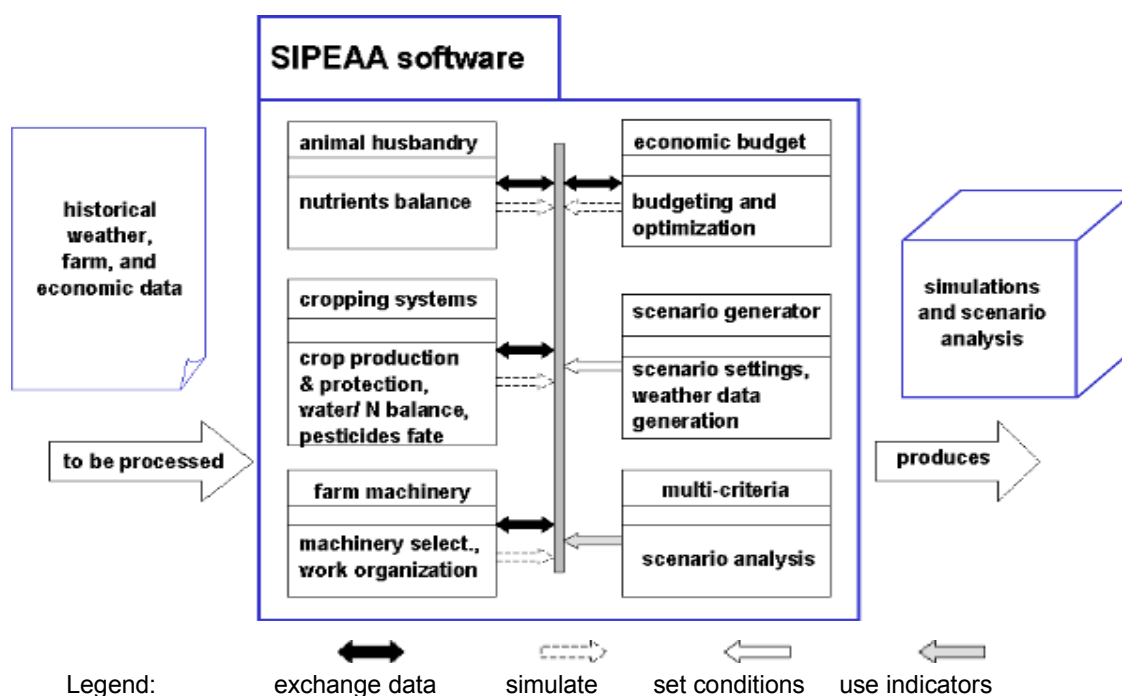


and .4) to create an integrated decision support database for policy and regulation enactment at regional or national levels. The ultimate objective is very ambitious, and exceeds the feasibility of the restricted time frame of the first term of the project, thus the effort in the preliminary phase will then be devoted to the development of a decision support system to be used at farm level.

The following research units are involved in the project:

- Research Institute for Industrial Crops (ISCI), Bologna (leading unit)
- Italian Sugar Beet Growers Association (ANB), Bologna
- Research Institute for Animal Production (ISZ), Cremona
- Dep. of Electronics, Computer Science and System Analysis (DEIS), Bologna
- Dep. for Promotion of Food Resources (DIPROVAL) , Bologna
- Institute of Agricultural Engineering (IIA), Milan
- Dep. of Crop Science (DIPROVE), Milan
- Institute of Agricultural and Environmental Chemistry (ICAA), Piacenza
- Dep.of Crop Science and Agricultural Technology (DPVTA), Udine

The following figure shows the major components of the software to be developed:



The methodological aspects related to model modularity and reusability in this project would benefit of a research activity in the area of model development which will be proposed within the EU 6th research Framework Programme (Van Ittersum, 2002). The technical framework for allowing modular model development will be devised, followed by model selection and implementation. Currently, use cases are being developed and the requisite analysis is being performed. Seven farms of various size and organization will be the case studies used during the preliminary phase of software design. Data will be collected and prepared for use to test the tools being developed. The research units involved are interested in establishing a cooperative effort with other groups working on the development of an integrated farm level decision support system (please contact: agronomy@isci.it).

### References

- Stöckle C.O., 1999. Proc. 1<sup>st</sup> Inter. Symp. Modelling Cropping Systems, Lleida, Spain, 19-24.  
 Van Ittersum et al., 2002. Proc. of the 7<sup>th</sup> ESA Congress. This volume

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