

# CH-FARMIS 2.0: A Sector-Model to Assess the Economic and Environmental Impacts of Swiss Direct Payment Schemes

*Quantitative sector models are an essential tool to assess sector-wide economic effects of agricultural policies. However, to include ecological assessments in economic sector models is still a methodological challenge. This poster describes an approach to inte-*

*grate ecological assessments into the sector model CH-FARMIS in order to allow for both comprehensive policy assessments and evaluation of single direct payments.*

## Aims of the project

- ▶ Assessment of economic and environmental effects of the Swiss agricultural policy on farm-, regional- and sector level
- ▶ Quantification of cost-effectiveness of different direct payments with emphasis on the payments for organic farms

## Methods

CH-FARMIS is a sector consistent farm group model, which allows for an assessment of economic policy impacts on farm, regional and sector level. In a flexible way, CH-FARMIS is able to represent the agricultural sector in farm groups according to various characteristics: region, farming system, farm type, etc. CH-FARMIS is based on farm accountancy data from the Zentrale Auswertung von Buchhaltungsdaten (ZA). Positive Mathematical Programming (PMP) facilitates realistic reproduction of the Swiss agricultural sector (Sanders et al. 2005).

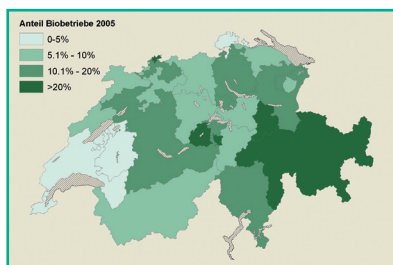


Fig 1: Diagramme of dispersion of organic farms in Switzerland, based on BFS data

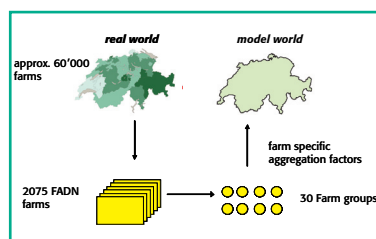


Fig 2: Representation of the farm sector by the farm group model CH-FARMIS

Currently, CH-FARMIS is extended in two steps in order to cover the environmental impacts of policy measures by simulating farmers' decisions:

- ▶ **Management intensities** are differentiated as sub activities corresponding to defined policy measures. For the activity wheat, for instance, four intensity levels are defined: conventional, IP, extenso and organic. Thus, the optimisation process will simultaneously consider the different activity intensities.
- ▶ **Environmental indicators** for biodiversity, eutrophication (N, P) and energy use are introduced for each activity and management intensity.

The SALCA life cycle assessment (LCA) data from Agroscope Reckenholz-Tänikon (ART) (Nemecek et al. 2005) will be used as a comprehensive data pool. In an iterative Delphi-procedure, by polling a set of competence teams, the LCA data is then adapted to the model needs.

Economic and environmental impact assessments will be carried out for:

- ▶ **Ex-ante scenarios:** Showing the potential impact of policy reforms
- ▶ **Policy evaluation scenarios:** Simulating alternative policy designs in order to estimate their cost-effectiveness in achieving environmental effects for the selected indicators

## Expected results

CH-FARMIS 2.0 can be used as a flexible assessment and evaluation tool, because the farm groups can be defined specifically to the subject in question. The model will produce the following outputs: commodity output, environmental impacts, and public expenditure on farm, regional and sector level.

We will employ the model to assess economic and environmental effects of future reforms of the Swiss agricultural policy. Furthermore, we will compare the cost-effectiveness of organic farming payments in delivering environmental goods with alternative policy measures.

CH-FARMIS 2.0 is planned to be operable in mid 2008.

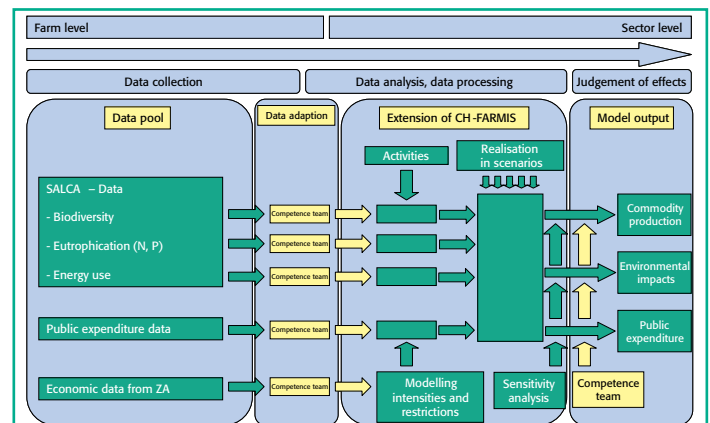


Fig 3: Schematic illustration of the extension of CH-FARMIS

## References

- Nemecek, T., Huguenin-Elie, O., Dubios, D. and Gaillard, G. (2005): Ökobilanzierung von Anbausystemen im Schweizerischen Acker- und Futterbau, Eidgenössische Forschungsanstalt für Agrarökologie und Landbau (FAL), Reckenholz.
- Sanders, J., Lampkin, N.H., Midmore, P. and Stolze, M. (2005): A policy impact model for organic farming in Switzerland, in Willer, H. (ed.), *ISO FAR: Proceedings of the Conference „Researching Sustainable Systems“*, International Society of Organic Agriculture Research (ISO FAR), Adelaide 2005.