

Sustainable Landscape Production Systems: a demand-oriented agricultural approach (SULAPS)

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Concept

Agriculture and forestry have a significant influence on landscape and habitats in the productive climate zones of the Alps. In the past decades, agriculture and forestry have been subject to a continuous process of change. Agricultural production and landscape evolve as dynamic and interdependent systems: landscape as an agricultural externality is important for tourism.

The production intensity in the use of grassland and animal husbandry changes due to increasing economic pressure and technical progress (local intensification and extensification). This has consequences for the biodiversity (plants, farm animals and wild animals) and the landscape.

In order to model and control this process, on the one hand, the necessary instruments do not exist to date and, on the other hand, mountain farming systems have to be adapted to future requirements. It is particularly important to link the optimal production – calculated by means of the economic agrarian structure model under the given framework conditions – with the location of the different landscape elements or crops as well as the buildings.

Research Targets

1. To work out alternative scenarios for the socio-economic environment and for the landscape demanded by society in two regions.
2. To define sustainability indicators and the respective standards that must be complied with for the implementation of the scenarios.
3. To develop and evaluate different agrarian structures for the scenarios defined whilst complying with the requirement of sustainability.
4. To disseminate the results in co-operation with the stakeholders and political decision-makers concerned and to work out proposals for adjustment of the legal framework.

Hypothesis: Policy

- The direct payment system is a suitable instrument for control of landscape development in the agricultural area of the Swiss Alps.
- The control effect with regard to landscape development can be improved by regionalising quality and quantity targets of desired elements of landscape, and measures.

Hypothesis: Economy

- The requirements for the agrarian structure differ depending on whether the target of „Producing agricultural products for the market“ or the target of „Creating cultural landscape as the raw material for tourism“ is weighted the stronger.

Hypothesis: Landscape

- In comparison with uncontrolled development, planned afforestation opens up chances to create additional coherent forest sanctuaries (desirable elements of landscape from the point of view of biodiversity).
- Conservation of the important, extensive and not intensively used meadows in grassland needs more targeted promotion by incentive instruments.

Hypothesis: Society

- From the point of view of sustainable development in the Alpine region, it is appropriate to preserve extensive agricultural farming in more remote areas in the longer term, if the target of foodstuff production is not economically self-supporting.
- The capital stock method of assessment of sustainability dimensions and indicators can make a significant contribution to the political debate as to how the costs of preservation of cultural landscape and habitats should be allocated.

Methods

Alternative landscape scenarios will be worked out for two different regions. An agrarian structure model will then illustrate the types of farms representative of the region concerned. The identification of future land-use will be carried out by means of a Mathematical Programming Model. Such a model is capable of selecting from a large number of interlinked activities those that produce a maximum objective value (e.g. the return on farm land of a region) and will establish the optimum land use taking into consideration the framework conditions (socio-economic environment) for the region. The current land use and the land use determined by the model for the various scenarios as well as the economic, ecological and social effects will be transferred to a GIS and visualised.

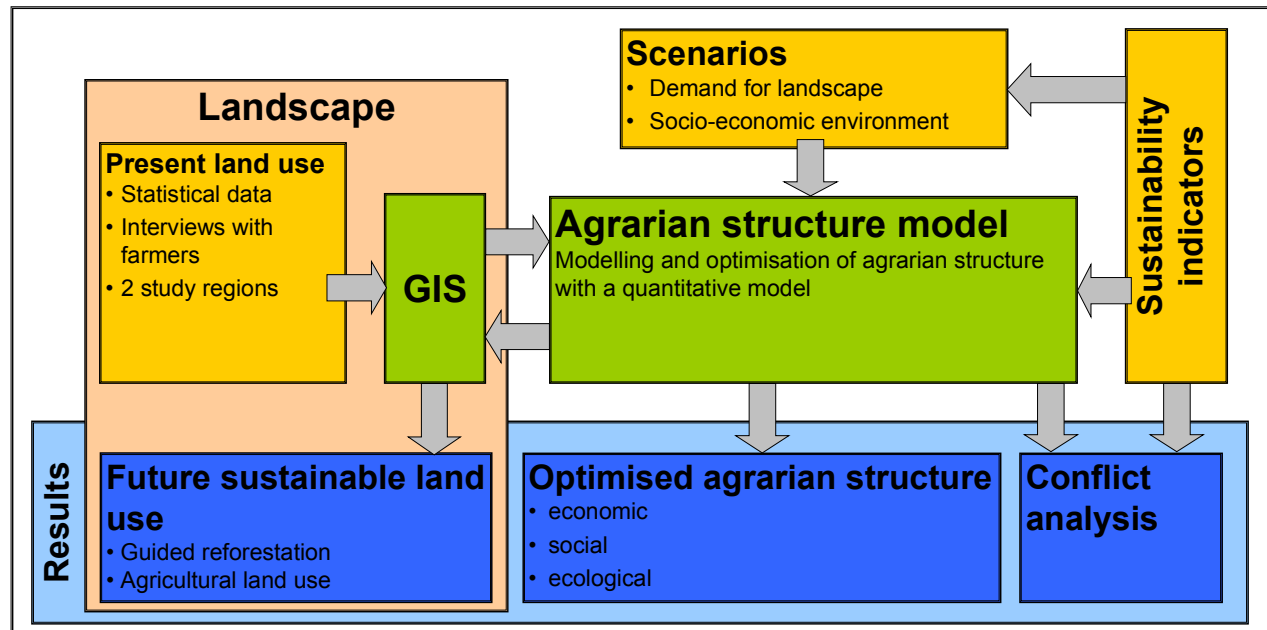


Fig. 1: Methods and working steps.

Expected results

- An instrument for the assessment of the agrarian structure in terms of landscape conformity and sustainability.
- Specific knowledge on the sustainable development of landscapes and habitats used for agricultural purposes in the Swiss Alps, in particular below the timberline.
- Bases for optimisation of production systems in mountain farming.
- Reference data for adaptation of the legal framework in view of an efficient use of resources with respect to land use and agrarian policy as well as controlled landscape development.

Networking

- Joint project FAT - INFRAS
- Co-operation with agricultural research stations FAL Zurich-Reckenholz and RAP Posieux
- Contact established with various NRP48-projects
 - Forest expansion in the Swiss Alps (P. Baur, WSL)
 - Vulnerability of the Alpine landscape and habitat (P. Bebi, SLF/WSL)
 - Conflicting expectations and objectives regarding the development of Alpine landscapes (M. Hunziker, WSL)
 - Driving forces for changes in management and biodiversity of Alpine grasslands (A. Lüscher, FAL/ETH)

On-site Research Places

The investigation will take place in two regions that possess favourable prerequisites with regard to data availability and that are open to tourism to different extents. The investigations will take place in two or three communities per region:

- high intensity of tourism: communities of Savognin, Cunter and Riom-Parsonz
- low intensity of tourism: parts of Albula Valley with the communities of Surava, Brienz, Alvaneu and Schmitten