



Wheat fields

STACCATO - SusTaining AgriCultural ChAnge Through ecological engineering and Optimal use of natural resources

Context

The key determinants of the stability of multiple ES delivery and biodiversity in agro-ecosystems and agricultural landscapes, including resilience to climate variability and extremes, much remains to be developed for the scientific foundation of ESS-based approaches. Besides the assessment of the functioning of productive ecosystems in terms of basic provisioning services is facing limits.

Main objectives

In order to advance long-term sustainable development of land use systems, against risks arising from multiple aspects of global change, STACCATO plans to quantify the sensitivity of ecosystem functions (ESF) and the services (ESS) generated from them to environmental pressures in representative agriculturally dominated landscapes in Europe. The focus is on local as well as regional land use intensity (including the socio-economic background) and biodiversity, and the potential impacts of future climate and land use change.

Following the framework of the Millennium Ecosystem Assessment (MEA), STACCATO define supporting services as ESF and deal with selected characteristic elements of 2 of the 3 service strands defined by the MEA, namely a) Provisioning Services (PS): nutrient cycling & crop production; b) Regulating Services (RS): biocontrol & pollination; and c) Cultural Services (CS): identity with cultural landscapes.

Studies are planned in representative regions across Europe (i.e. Bulgaria, Germany, Romania, Spain, Sweden and Switzerland), in landscape along a gradient reflecting changing geo-climatic and land use intensity, and socio-economic conditions.

STACCATO aims at achieving the following specific objectives:

- Investigate the interactions between crop production areas and the landscapes in which they are imbedded across a European wide field site network;
- Develop valuations of the investigated ESF/ESS strands through monetary as well as non-monetary methods;
- Develop Ecological Engineering and Eco-functional intensification in conventional, integrated or organic agriculture.

Main activities

To achieve its goals, STACCATO will implement the following activities:

- Quantification (incl. the assessment of uncertainty) of the current and future dependencies of ESS of the cropping systems on a) local & regional land use intensity and its driving forces, b) biodiversity and c) climate;
- Study of three ESS strands: a) nutrient status & crop production, b) crop related biocontrol & pollination, and c) cultural services and how they are affected by land use intensity

Regarding stakeholder engagement and dissemination of the project outputs, STACCATO will pay particular attention to the involvement of a broad spectrum of stakeholders throughout the whole duration of the project by:

- Co-Designing STACCATO project and Ecological Engineering in close interaction with stakeholders;
- Developing guidelines for decision makers (incl. farmers) to further enhance ESS provision, in particular through ecological engineering as a tool for eco-functional intensification;
- Developing socio-economic analytical frameworks & tools for promotion of advanced land management practices, based on analyses of driving forces & stakeholders

Partners:

UFZ - Helmholtz Centre for Environmental Research, Leibniz, GERMANY (Coordinator)
 Butterfly Conservation Europe (International Organization), Wageningen, THE NETHERLANDS
 Pensoft, Sofia, BULGARIA
 Agriculture University of Plovdiv, BULGARIA
 Bulgarian Academy of Sciences, Animal Diversity and Resources, Sofia, BULGARIA
 Saxon State Office of Environment, Agriculture and Geology, Dresden, GERMANY
 Landratsamt Mittelsachsen, Freiberg, GERMANY
 Fundatia ADEPT Transilvania, Mures, ROMANIA
 Babeş-Bolyai University, Cluj-Napoca, ROMANIA
 Sapientia University, Cluj-Napoca, ROMANIA
 Autonomous University of Barcelona, SPAIN
 Swedish Univeristy of Agricultural Sciences, Uppsala, SWEDEN
 Lund University, SWEDEN
 Swiss Federal Research Institute, Birmensdorf, SWITZERLAND

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